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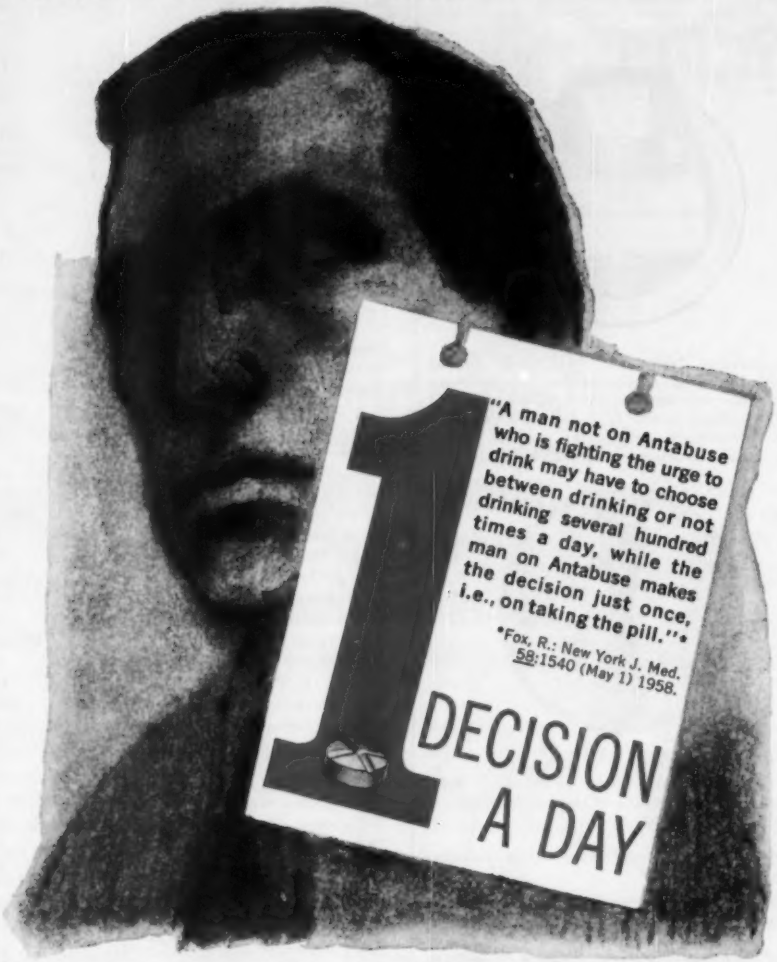
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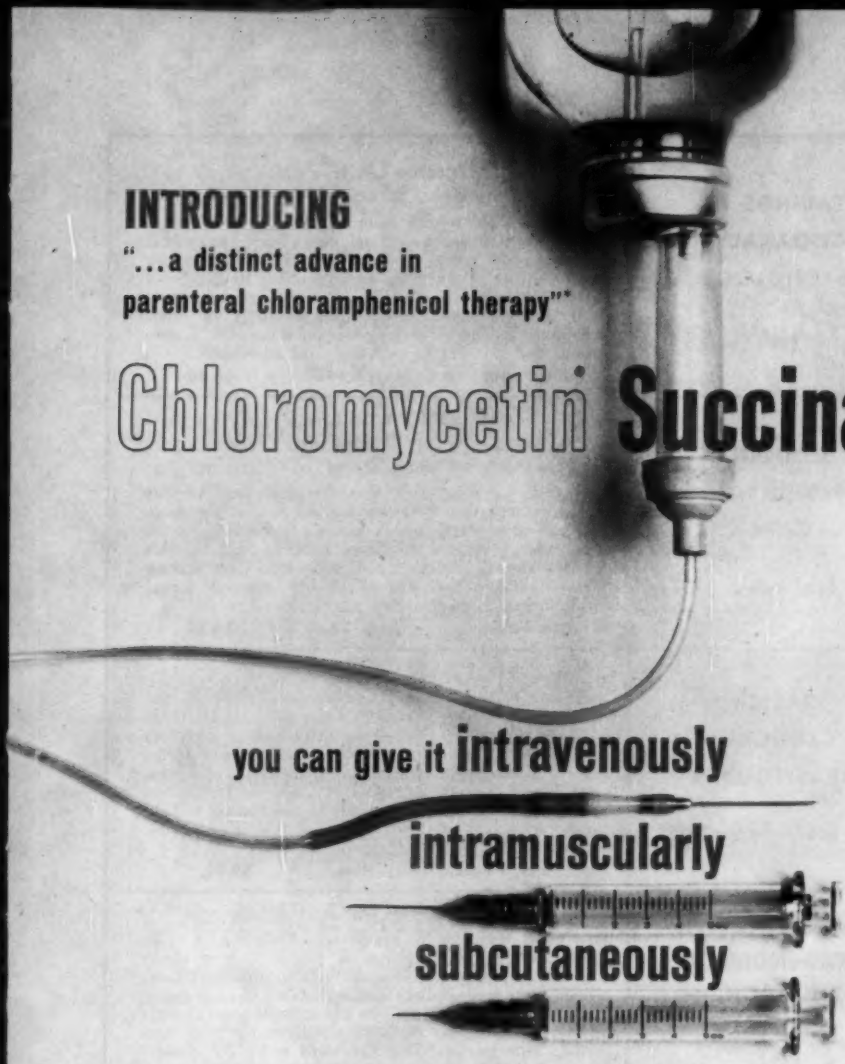

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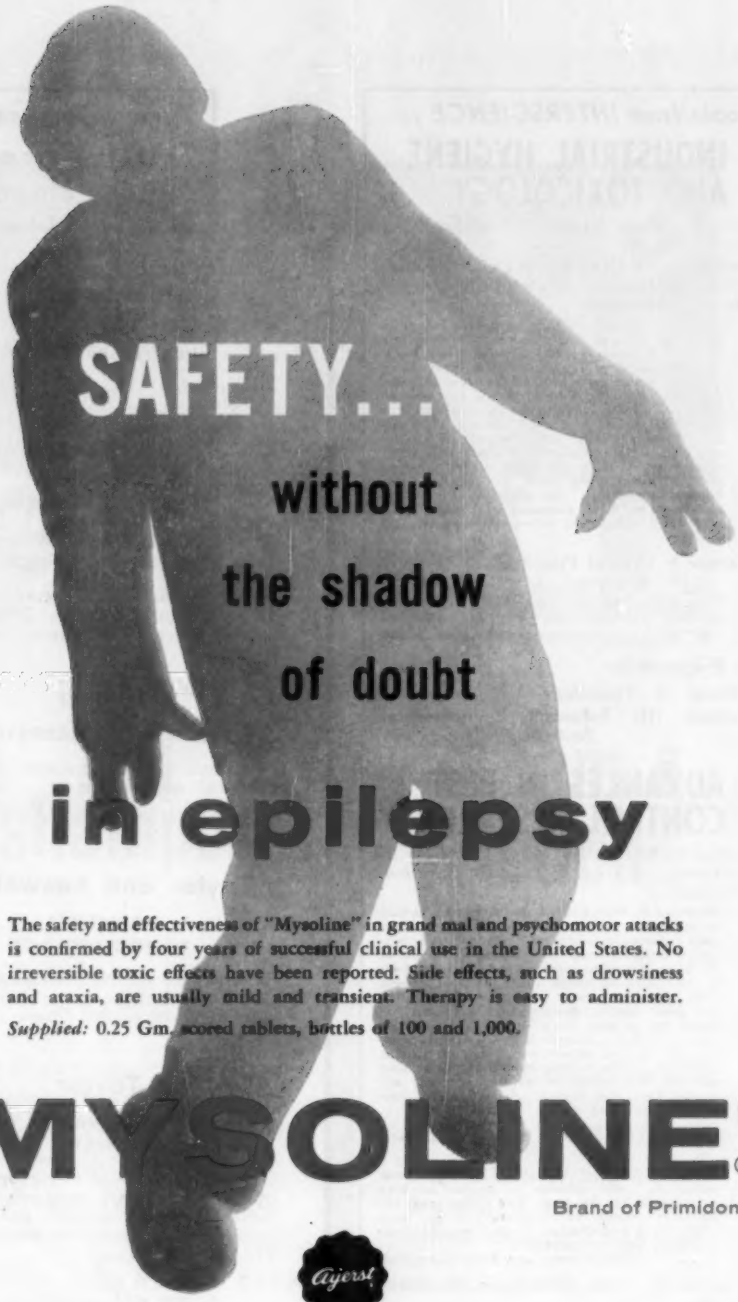

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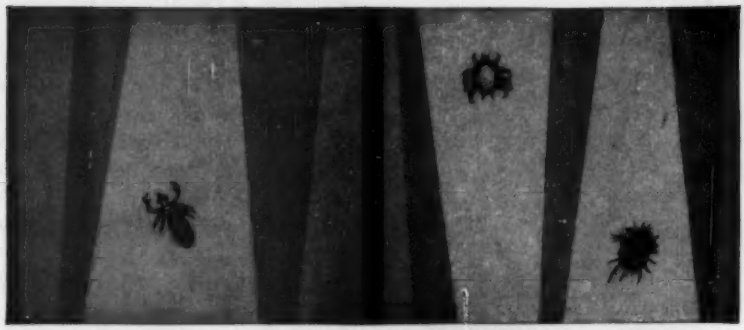

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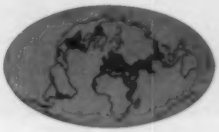

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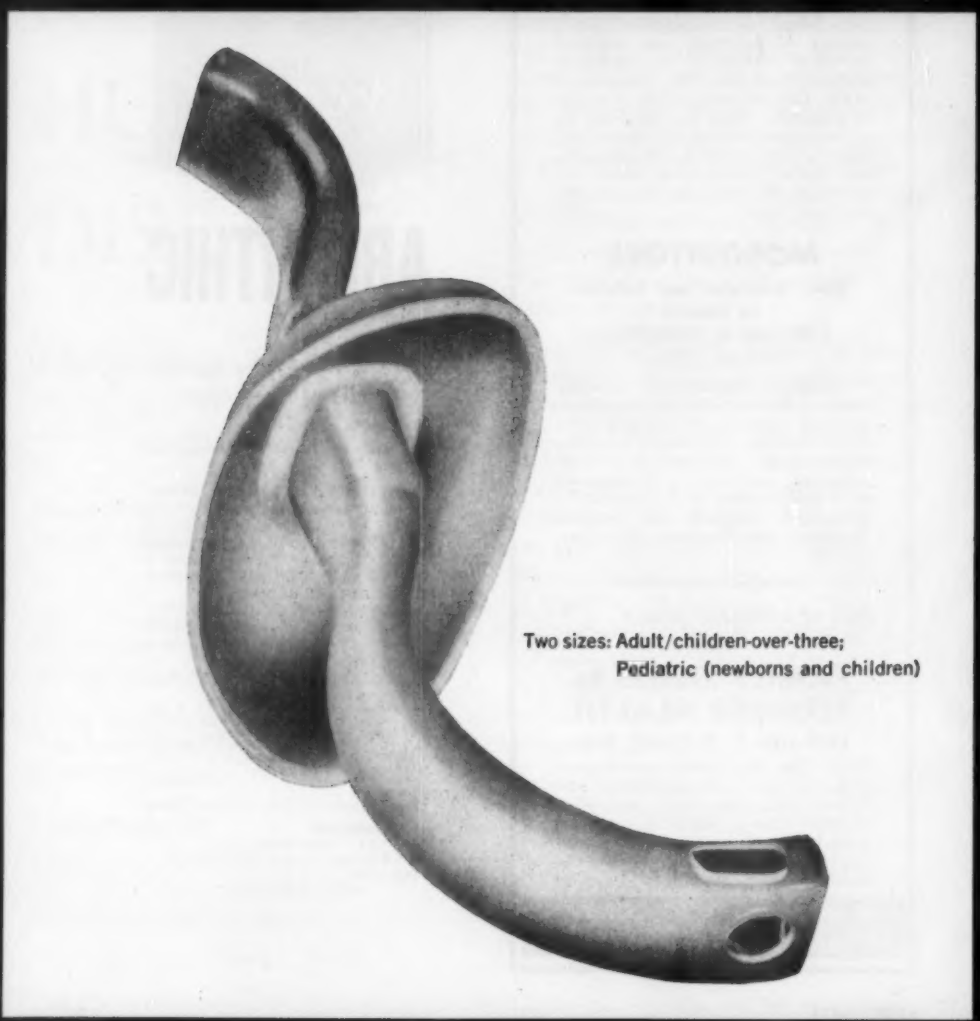

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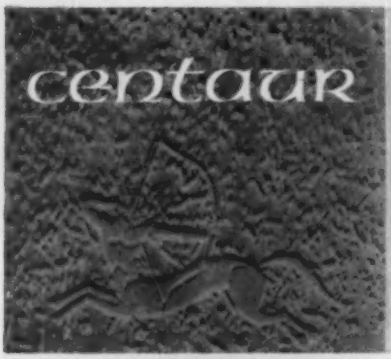

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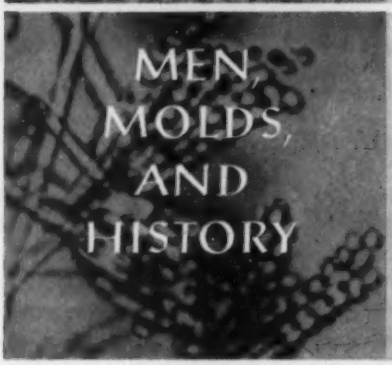

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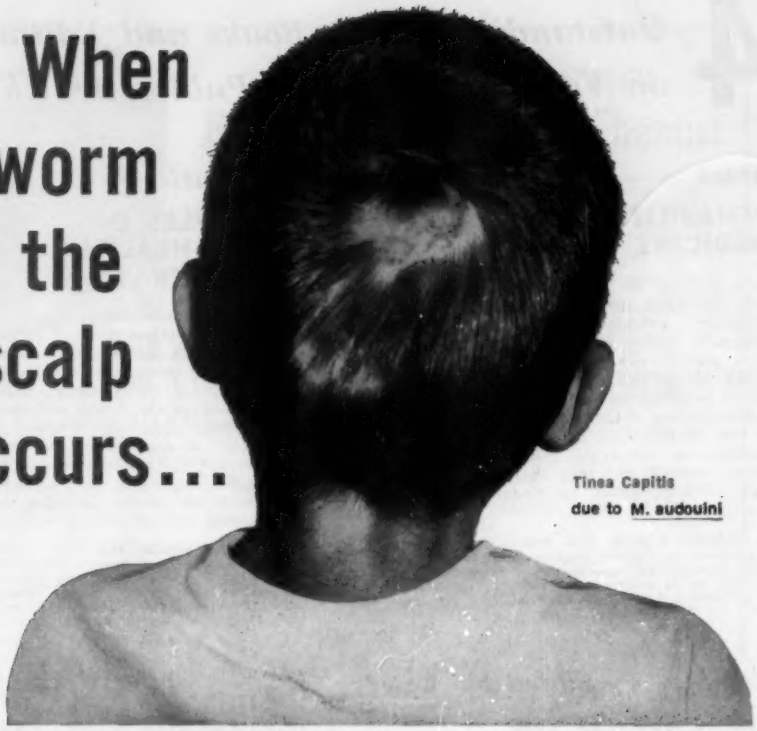

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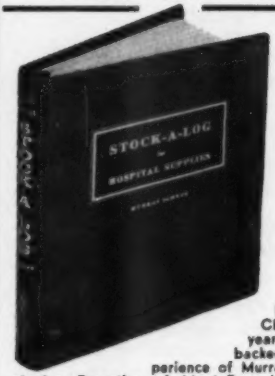

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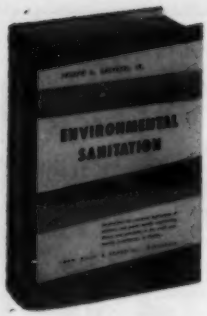

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A BOOKSHELF ON THE SOCIAL SCIENCES AND PUBLIC HEALTH

George Rosen, M.D., Ph.D., F.A.P.H.A., and Edward Wellin, Ph.D.

DESPITE the growing evidence that Salk vaccine is safe and effective in preventing poliomyelitis, about one-third of the preschool children in the United States have not been immunized. It is clear that much of the paralytic polio that occurred in 1958 could have been prevented if more persons, and particularly those in the youngest age groups, had been vaccinated. Yet the fact remains that large groups in the population fail to accept immunization, and it is a matter of considerable interest to public health workers to know why these people behave as they do.

Similarly, other health workers want to know why prospective patients avoid seeking the physician's services or, having consulted him, do not take his advice. Still others want to know why fluoridation of water supplies, a practice which seems so well founded to the health worker, is rejected by some communities. Why, indeed, do people behave as they do? Today, more and more health workers are asking this question.

In large measure, possible answers to this question will be found in the studies and researches of the social scientist. As long as health measures could be applied without the knowledge or with only the tacit acquiescence of the individual, as in water purification or pasteurization of milk, it was possible for public health workers to stress the laboratory approach, the epidemiological method, and statistical technics, and to relegate to the background the behavior of the individual. Increasingly, however, it has become evident that public health will be concerned more and more

with the individual in his normal habitat, the social group. Many of the current problems of public health require alterations of personal habits and ways of living. And this requires an understanding of human behavior, the factors and conditions that govern it, and how such knowledge may be applied.

An explicit awareness of the central relevance of social science for the practice of public health is of recent origin. Until quite recently, public health work was implicitly premised on the complete rationality of human behavior. This does not mean that earlier public health workers were unaware of values, customs, beliefs, and related matters in determining health action. It was assumed that all one had to do was to inform and enlighten the people in matters of health and they would act appropriately. But as we are aware, the matter is not so simple. The human factor is considerably more complex than was originally envisaged. Future advances will require the consent and the cooperation of the people, and will depend on an understanding of how to approach them, how to motivate them, how to help them recognize and understand the problems in the solution of which they are asked to participate. And such action will be based on knowledge developed through the use of the relevant concepts, tools, and methods of the social sciences.

Social Sciences—Behavioral Sciences

Where and how can the public health worker obtain knowledge of the social sciences relevant to his problems? The purpose of this article is to call attention to some of the sources and resources that may be used for this end. Before doing so, however, a word of explanation concerning the social sciences is in order. The term "social sciences" is a comprehensive one and includes a number of bodies of organized knowledge, each of which is concerned with some aspect of man in society. History, economics, and political science are the older members of the group; sociology, social psychology, and cultural anthropology are relative newcomers, although their roots reach back into the distant past. More recently, the latter three have been designated as the "behavioral sciences," implying that they only are concerned with human behavior. Actually, all the social sciences are concerned with the how's and why's of human behavior, but in each case, from some particular point of view. In this paper, we are concerned chiefly with sociology, social psychology, and cultural anthropology, but attention will be called to such aspects of the other social sciences as are relevant to the practice of public health.

While easy to label, sociology, social psychology, and cultural anthropology are less easily described and quite resistant to precise differentiation. Consider their similarities first. Most of the scientists in these fields have the same natural habitat—a college or university department—and their activities tend to focus on teaching and research. As knowledge in each of these disciplines increases, they are marked by burgeoning specialization. Thus, the social sciences face the same problem as does public health, namely, to educate people who will be generalists and yet have specialist training. Furthermore, and this is crucial in understanding the strengths and the limits of social scientists as a group, their dominant orientation is to further "basic" psychology, sociology, or anthropology, while the endeavor to "apply" social science knowledge and skills to problems of health or industry, although undoubtedly of growing interest, is still secondary and derivative.

When one considers the differences between the three social sciences of concern here, it is essential to realize at the outset that logic cannot explain what must be understood historically. Each

of the sciences has traversed distinct and somewhat isolated routes of development. Indeed, until recent decades, candidates for the doctorate in any one field could often complete their training unsullied by exposure to the concepts and methods of the sister disciplines.

To reduce rather complicated genealogies to frankly oversimplified terms, sociology grew out of various currents of social reform and theories intended to explain growth and change in society, social psychology from the work of early experiments in individual and group psychology, and anthropology from the observations of geographers, explorers, and travelers. Although each discipline has traveled far from its beginnings, each bears characteristic ancestral features.*

The various social sciences differ among themselves with respect to the data with which they deal. History, economics, and political science tend to rely to a larger extent on library materials and statistical compilations, although even here there are no hard and fast lines. History depends in part on archeologic data, i.e., on data dug up in the field, and some of this is of public health interest. Economists concerned with medical care make field studies, and this is increasingly true of empirically-minded political scientists. Thus, the distinction between these sciences and sociology, social psychology, and cultural anthropology with respect to their data is in some measure a matter of degree. Yet the degree is significant, for the latter fields tend to develop their data empirically and in field studies. However, even these empirically-minded sciences differ to a certain extent as to the kinds of primary data they produce.

Usually, but not invariably, the sociologist and the social psychologist deal with populations whose language and culture patterns are similar to their own; the anthropologist is used to working with subjects from cultures other than his own. Similarly, one might point to certain differences in the methods employed to obtain data. Anthropologists rely heavily on field notes based on their own observations of individual and group behavior, and on repeated, extensive interviews with small numbers of informants. Social psychologists incline toward data secured under conditions of controlled research design, with animals and human beings as subjects. Sociologists tend to occupy a middle ground, employing participant observation, experimental designs, interviews, and questionnaires as the situation requires or permits.

In addition to the peculiarities of method characteristic of the respective fields, each discipline is oriented around a different central concept. For anthropology, the unifying concept is that of culture, which refers broadly to the habits, values, and way of life of a people. In social psychology, the concept of motive is central; this is the internal drive, in complex interaction with external and other internal factors, which constitutes an important determinant of the individual's behavior. Sociology, numerically the largest of the disciplines discussed here, is centrally concerned with the study of patterned relationships within and between groups. These come under the concepts of social organization, institutional structure, and social change. The term institution refers not to things like hospitals and jails, but to those points in the flow of human affairs around which develop enduring patterns of interaction and mutual expectation.

Having described certain differences between social scientists, it remains to point out that exceptions and "mavericks" abound. A number of large graduate schools now offer curriculums in coordinated behavioral science; this

* For a fuller discussion of differences between social sciences, see Paul, Benjamin D. Social Science in Public Health. A.J.P.H. 46, 11:1390–1396 (Nov.), 1956.

helps provide students with some degree of across-the-board training, and serves to dilute the validity of some of the interdisciplinary distinctions noted above.

Social Science Resources

Under this head are discussed the disciplines themselves, literature, sources of financial support, and guidance and consultation resources.

1. Anthropology, Psychology, and Sociology—The first set of resources of interest to public health—the fields that constitute the social sciences—has been discussed above. To review briefly, they are sociology, social psychology, and cultural anthropology. Although akin in that they are concerned with the scientific study of human behavior, they differ in their orientations and strong points.

2. Literature—Each of the fields has two or more scientific journals. The major ones are listed in the bibliography. While most of these journals permit one to sample the flavor of the fields they represent and often present papers of interest to any educated reader, much of the material, designed for a specialized audience, may strike the unprepared reader as highly technical in treatment and esoteric in scope of interest. (Caveat lector.)

None of the fields has a single or agreed "standard text," nor is there consensus within any field as to what a possible universally acceptable text might have in terms of content, organization, levels of abstraction, or approach. However, for an overview of any of the behavioral sciences, the busy reader would be well advised to peruse some recommended text rather than any of the scientific journals. There are also several recent volumes which attempt to provide a unified or integrated approach to the social sciences as they relate to health. One is the book of cases by Benjamin D. Paul, "Health, Culture and Community"; the other, the more recent book of readings edited by E. Gartly Jaco, "Patients, Physicians and Illness."

Two foundations, the Health Information Foundation and the Russell Sage Foundation, have sponsored publications which are required reading for both health workers and social scientists. Too long for inclusion here, they are listed under appropriate headings in the bibliography. Special note should be made of HIF's continuing annual editions (beginning in 1952) of "An Inventory of Social and Economic Research in Health." Distributed as a service to the health field, this series of volumes provides organized information on the what, where, when, how, who, and occasionally the why, of most health-related research currently being conducted in all settings throughout the country.

Listed under appropriate subject headings in the bibliography is a representative, but by no means exhaustive, sampling of books and articles dealing with applications of the social sciences to public health.

3. Sources of Financial Support—As reported by Anderson and Seacat,* funds for research by social scientists in the health field come from a variety of sources. The two major sources are foundations—local and national, small and large—and the federal government, particularly the U. S. Public Health Service and its National Institutes of Health. Others include universities and colleges, state and local governments, voluntary health and welfare associations, insurance firms and other private business groups, hospitals, and private individuals.

4. Guidance and Consultation—In modest but increasing numbers, social scientists are found in schools of public health, medicine, nursing and social work, in hospitals, and in official and voluntary health agencies at national,

* The Behavioral Scientists and Research in the Health Field—see bibliography.

state, and local levels. They may be available to other agencies in the community or region for a variety of purposes, including aid in designing and conducting studies and analyzing data; teaching; providing inservice training; helping in community planning; sharing research findings with health workers; helping to design, carry out, and interpret evaluations; and participating in programs of public health associations. As noted earlier, the majority of social scientists are based in academic departments within colleges and universities. The general picture throughout the country, however, remains one in which their value as resources for public health remains largely untapped. Like their social science colleagues who work in health settings, they may be available for guidance and consultation purposes.

Many state universities and colleges and land grant colleges are particularly ready to assist community health agencies. Indeed, much of the research in this country during the 1930s and 1940's on health attitudes, rural health needs, and the like was sponsored by departments of rural sociology in state universities.

However, privately endowed teaching institutions should not be overlooked. Faculty members may be receptive, in furtherance of their own teaching, research, or civic interests, to establishing working relations with health people in the community.

Problems of Interdisciplinary Work

Two individuals brought up in different cultures may speak mutually unintelligible tongues, react differently to the same stimuli, and be motivated toward divergent goals. We would normally expect them to communicate poorly with each other and would be surprised only if the contrary occurred.

However, it is a truism that a shared language and general cultural background do not of themselves guarantee effective communication. Varieties of professional training lead to varied ways of viewing the same phenomena and to different "languages" and values, even within the same general cultural milieu.

At one extreme, there are social scientists who fail to grasp basic concepts of public health and, misconceiving, spend their time providing answers to questions which nobody asked. Cases are also known in which the social scientist designs, and attempts to execute, research without due regard for the exigencies of service, thereby precipitating needless service-versus-research conflicts.

At the other extreme, there are health officers for whom workers in health education, social work, mental health, and the various behavioral sciences are all somehow part of a confusing and undifferentiated collection of people who are in and around their bailiwicks, but do not constitute workers in real public health. This is like the map of the United States that the confirmed New Yorker is said to carry in his head.

As long as the health officer operated within a restricted and routinized sphere, his "map" of the behavioral sciences and other fields hurt nobody and might even have helped him, since even a useless map of unknown territory provides more security than no map at all. However, with the placing of increasingly diverse and complex demands on public health and the corollary expansions of the public health "family," the above kinds of percepts have become barriers to effective interdisciplinary communication and work.

Of course, few problems that arise in collaboration between public health and the social sciences are unique to this specific area of interdisciplinary work. They are generic to the larger matter of teamwork, whether within a single field or between two or more fields, and differ only in terms of the degree or phrasing of collaboration.

Areas of Activity and Accomplishment of Social Scientists in Public Health

Within recent decades there has developed a distinct interest in studying the relations between the health and the social sciences. Actually, this is not so new as it sounds, for the social sciences in considerable degree have their roots in the health field. Areas of interest to social scientists today were first developed in a number of instances by those concerned with public health, and this applies as well to methods of research. Political arithmetic, medical topography, and sanitary reform are some of the sources from which the present-day social sciences have come, and Petty, Villermé, and Chadwick belong no less to the history of social science than to the history of public health.

Increasing maturation and development of knowledge led to a separation between the health and the social sciences, and it is only in recent decades that the older tradition has been revived. This tradition has taken on new life as public health workers and social scientists tended to find that their respective problems coincided in the same population, or that some piece of empirical research conducted by one group threw light on the problems of the other groups.

Until now the major contributions of social scientists to public health have been predominantly in research, and to a lesser degree, in teaching, consultation, and training. While any classification is manifestly in some degree arbitrary, social science research in the health field has tended to focus on three areas: the community and its structure and culture patterns as they affect the health values and practices of its members, institutions concerned with health, and the social dimensions of health and disease. Furthermore, the point has been made repeatedly that social science participation in research on noncommunicable and long-term illness is badly needed. This is founded, to begin with, on the recognition that public health will in the future be concerned increasingly with such illness, and, second, on the conviction that a profounder understanding of the patterns of living of groups and individuals in relation to chronic illness will throw a needed light on the epidemiology, etiology, and control of such disorders. Because of the more obvious connections of sociocultural and psychological factors with mental illness, and the encouragement of social science approaches by mental health workers, there is probably more research in this area than in all other areas of long-term illness combined. However, other problems have received attention. Freeman and Reeder (see bibliography below) provide a list of 107 items, which includes a number of studies of social and psychological factors associated with morbidity and mortality, fertility, rheumatoid arthritis, cardiovascular disease, and other conditions.

The following bibliography is intended to illustrate the points made above, and to suggest where the reader may go for further information. It is not intended to be an exhaustive listing.

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2. *Theory and General Orientation*

Each of the social sciences, like any scientific discipline, has a set of concepts that provides the intellectual tools with which the scientist works. They define the phenomena to be studied and enter into the theories developed and used in the social sciences. Since many of the ordinary aspects of social life are the subject matter of these sciences, it is not surprising that the terms used by the layman may sometimes also be used by the social scientist. The publications listed below will enable the public health worker to pick up some of the threads to guide him further by showing him how the concepts are used.

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3. *Organization, Institution, and Community*

Man is by nature a social creature. In living together, human beings respond to each other, and shape their behavior in relation to that of others. They develop social relations which take form as accepted roles and positions in the group. An interrelated system of such roles is called a social organization or a social structure. When such systems acquire a relative degree of permanence, they are called institutions. A community is a human group which is organized in terms of social relationships, roles, and institutions. The study of social organization and of institutions is a long-standing tradition in social sciences, especially in anthropology and sociology. Systematic field observation has been a characteristic development of the past few generations. It was stimulated at first by anthropologists like Boas and his students, by sociologists concerned with social problems, and later by sociologists like Robert Lynd who turned to field study of communities for scientific purposes. At the same time, the study of institutional organizations was furthered, largely by Elton Mayo and his associates at the Harvard School of Business. For the most part, these studies have concerned themselves with business organizations, trade unions, and government departments. In the health field, hospitals have received most attention. There is as yet no published study of a health department from this viewpoint, although there is a study of a health agency, and several communities have been investigated. Some of these studies are critically reviewed in the publications by Caudill and Homans listed above.

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4. Socialization and the Health Professions

In becoming a member of a health profession, the individual undergoes a process of socialization. This process involves not only the acquisition of knowledge and skills, but, even more significantly perhaps, the acquisition of the values, attitudes, and behavior patterns that enter into and make up the role which the person is expected to occupy and exercise. Social scientists have had an interest in this area, and it has received a great deal of attention. For the social scientist, however, the health professional is but one of a number of occupational types. What happens to people when they enter a profession is of particular interest in the field of public health, which is multidisciplinary and where a number of professional and nonprofessional groups must work together.

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5. Social Class, Cultural Difference, and Health

Health is part and parcel of the social class system of a community. Several studies in the United States and in other countries highlight the significance of class considerations in dealing with various kinds of public health problems. Values and perceptions related to the mode of life characteristic of a given social class are expressed in the behavior of its members. Such behavior will vary with time and place. It has been noted, however, that members of lower social status are less likely to fully utilize child health clinics, have their children immunized, or use medical care services even when available on a prepaid

basis. Differences of this kind are likely to be accompanied by differences in expectations concerning illness and health. Furthermore, families in a lower social class tend to be suspicious of authority, and the latter may be personified for them by the official health agency. The public health movement was originally conceived and implemented chiefly by middle class people. Only recently has there appeared an awareness that the values, expectations, and goals of public health workers are not necessarily the same as those of many of the people whom they seek to serve. This section presents a number of studies concerned with this problem. Following a few general papers, items are listed dealing with child care; mental illness and mental health; medical care; perception, communication, and social participation.

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7. *Methods of Social Research*

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9. *Applications and Results*

By the very nature of their work, people in public health are action-oriented. The public health practitioner will want to know what he can do with the knowledge, ideas, and technics developed by the social scientists. This section lists a number of writings that endeavor to grapple with this crucial problem. Under other headings in the bibliography are additional publications or parts of publications that are relevant here.

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Leighton, A. H., and Longaker, A. "The Psychiatric Clinic as a Community Innovation" in Explorations in Social Psychiatry. Edited by A. H. Leighton; J. A. Clausen; and R. N. Wilson. New York, N. Y.: Basic Books, 1957, pp. 366–382.
Paul, B. D. (editor). Health, Culture and Community. New York, N. Y.: Russell Sage Foundation, 1955.
Paul, B. D. Social Science in Public Health. A.J.P.H. 46:1390–1397, 1956.
Prince, J. S. The Health Officer and Community Power Groups. Health Education Monographs (Nov. 2), 1958, pp. 16–31.

10. *Publications Series of Joint Public Health-Social Science Interest*

Health Information Foundation, Social Science Research Council, and Russell Sage Foundation have each sponsored series of publications of considerable interest both to public health and social science.

Health Information Foundation (420 Lexington Ave., New York 17, N. Y.) lists the following in its Research Series and has also sponsored other publications. The following six monographs are distributed as a service to the health field.

Anderson, Odin W., and Seacat, Milvoy. The Behavioral Scientists and Research in the Health Field, 1957.
Anderson, Odin W., and Alksne, Harold. An Examination of the Concept of Medical Indigence, 1957.
Croatman, Wallace, and Sheatsley, Paul B. The Prescription Pharmacist Today, 1958.
Freidson, Eliot, and Feldman, Jacob J. The Public Looks at Hospitals, 1958.
————. Public Attitudes Toward Health Insurance, 1958.
————. The Public Looks at Dental Care, 1958.

A few volumes in the series published by Russell Sage Foundation (505 Park Ave., New York 22, N. Y.) are:

Paul, Benjamin D. (editor). Health, Culture and Community, 1955.
Saunders, Lyle. Cultural Difference and Medical Care, 1954.
Simmons, Leo W., and Wolff, Harold G. Social Science in Medicine, 1954.
Spicer, Edward H. (editor). Human Problems in Technological Change, 1952.

The Committee on Preventive Medicine and Social Science Research of the Social Science Research Council (230 Park Ave., New York, N. Y.) has to date issued three memoranda, and may issue more, each concerned with defining an area of research of mutual interest to social scientists and workers in public health and preventive medicine.

Foster, George M. Problems in Intercultural Health Programs (Apr.), 1958.
Simmons, Ozzie G. Social Status and Public Health (May), 1958.
Caudill, William. Effects of Social and Cultural Systems in Reactions to Stress (June), 1958.

11. *Social Science Texts*

This is a small sampling of a large universe of social science texts. All can be recommended. Perhaps the single most useful, if poorly titled, volume is "Readings in Social Psychology"; its authors include not psychologists alone but all varieties of social scientists. Publications below supplement material listed elsewhere in the bibliography under "Theory and General Orientation."

Maccoby, Eleanor E.; Newcomb, Theodore M.; and Hartley, Eugene L. (editors). Readings in Social Psychology (3rd ed.). New York, N. Y.: Holt, 1958.
Beals, Ralph L., and Hoijer, Harry. An Introduction to Anthropology (rev. ed.). New York, N. Y.: Macmillan, 1959.
Keesing, Felix M. Cultural Anthropology. New York, N. Y.: Rinehart, 1958.
Kroeber, A. L. (editor). Anthropology Today. Chicago, Ill.: University of Chicago Press, 1953.
Broom, Leonard, and Selznick, Philip. Sociology. Evanston, Ill.: Row, Peterson, 1958.
Landis, Paul H. Introduction to Sociology. New York, N. Y.: Ronald Press, 1958.
Rose, Arnold M. Sociology. New York, N. Y.: Knopf, 1958.

12. *Social Science Journals*

The list is a selective sample of current journals in psychology, sociology, and anthropology.

American Psychologist, American Psychological Association, 1333 16th St. N.W., Washington 6, D. C.

Journal of Abnormal and Social Psychology, American Psychological Association, 1333 16th St. N.W., Washington 6, D. C.

Journal of Social Issues, Society for the Psychological Study of Social Issues, 291 Broadway, New York 7, N. Y.

American Journal of Sociology, University of Chicago Press, Chicago 37, Ill.

American Sociological Review, American Sociological Society, 49 Sheridan Ave., Albany 10, N. Y.

Rural Sociology, Rural Sociological Society, Department of Rural Sociology, College of Agriculture and Home Economics, University of Kentucky, Lexington, Ky.

Social Forces, University of North Carolina Press, Box 630, Chapel Hill, N. C.

Sociology and Social Research, University of Southern California, University Park, Los Angeles 7, Calif.

American Anthropologist, American Anthropological Association (W. S. Godfrey, executive secretary), Logan Museum, Beloit College, Beloit, Wis.

Human Organization, Society for Applied Anthropology, 150 East 35th St., New York 16, N. Y.

American Journal of Orthopsychiatry, American Orthopsychiatric Association, 1790 Broadway, New York 19, N. Y.

Human Relations, Institute of Human Relations, 2 Beaumont St., London, W. 1, England.

Public Opinion Quarterly, Princeton University, Box 486, Princeton, N. J.

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This is a special review article prepared at the request of the Editorial Board.

Keeping Abreast of Science News

A Science Information Service has been established in the National Science Foundation to "provide or arrange for the provision of, indexing, abstracting, translation, and other services leading to a more effective dissemination of scientific information, and undertake programs to develop new or improved methods, including mechanized systems for making scientific information available."

The President approved this plan on the basis of recommendations made by his Science Advisory Committee, headed by James R. Killian, Jr., Sc.D. It is designed to "help meet the critical needs of the Nation's scientists and engineers for better access to the rapidly mounting volume of scientific publication." Fullest use will be made of existing information services by the new agency which will supplement rather than swallow them.

Schools of public health are earnestly engaged at present in taking stock. What should they teach and how? What should be the composition of the student body? What should be the length of the curriculum? It is against the background presented in this report that such questions must be viewed.

TRAINING OF PUBLIC HEALTH PERSONNEL IN THE UNITED STATES AND CANADA

A SUMMARY OF 10 YEARS' ADVANCE IN SCHOOLS OF PUBLIC HEALTH 1947-1948 TO 1957-1958

Wilson G. Smillie, M.D., F.A.P.H.A., and Martha Luginbuhl

In 1946, the Committee on Professional Education of the American Public Health Association prepared a statement of "minimum requirements" for accreditation of institutions for the degree of master of public health (diploma of public health in Canada). Professor C.-E.A. Winslow was appointed accreditation consultant for the committee and developed the accreditation procedures.

In 1947-1948, Professor Winslow began an annual summary report compiled from information furnished by each school, upon the status of the schools. The form of this report has been kept almost unchanged during the subsequent ten years. Thus it is possible to assemble data from the 1947-1948 report and compare them with similar data for 1957-1958. By these means we are able to review the changes that have been made in training of public health personnel during the past ten years and to indicate future trends.

In 1947-1948 there were ten schools of public health—California, Columbia, Harvard, Johns Hopkins, Michigan, Minnesota, North Carolina, Toronto, Tulane, and Yale. During the past ten years three schools have been added—Montreal, Pittsburgh, and Puerto Rico.

I. Senior Faculty

Changes in senior faculty over a ten-year period are presented in Table 1. In the ten schools in existence in the earlier years there has been a slight increase in the number of full professors but a marked increase of nearly 80 per cent in the number of associate professors. There has also been an appreciable increase in the utilization by the schools of public health of full-time professorial talent from other university departments. The cordial interrelationships that have grown up between schools of public health and various other university departments, such as the departments of medicine, dentistry, nursing, engineering, education, sociology, economics, business administration, and so forth, have been a most favorable development in this field.

Table 1—Distribution of full-time senior faculty members—accredited schools of public health, academic years, 1947-1948 and 1957-1958

Professorial Rank	1947-1948	1957-1958	
	10 Schools	13 Schools	10 Schools
Total	155	254*	215
Professors	85†	120	99
Associate Professors	55	113	98
Vacancies	15	21	18

* In addition 82 senior faculty were reported as full-time in the university but part-time in the school of public health. Similar figures were not available for 1947–1948.
† Includes three "adjunct" professors.

Table 2—Full-time senior posts by department of study—schools of public health, academic years, 1947-1948 and 1957-1958

Department	1947-1948		1957-1958	
	Schools	Persons	Schools	Persons
Total	—	156	—	330*
Biochemistry and Nutrition	5	7	13	23
Epidemiology	10	17	12	30
Sanitation, Sanitary Chemistry	10	20	12	28
Microbiology, Virology, Immunology	7	13	11	31
Public Health Administration, Public Health Practice	8	17	11	30
Vital Statistics, Biostatistics	10	13	11	24
Health Education	6	9	9	16
Industrial Health	3	4	9	16
Maternal and Child Health	6	7	9	20
Public Health Nursing	4	7	9	17
Mental Health	2	2	8	12
Social, Economic Factors in Medical Care	4	4	8	15
Hospital Administration	4	6	7	10
Parasitology, Tropical Diseases	5	9	7	19
Physiological Hygiene	7	10	7	15
Public Health Dentistry	2	5	3	3
Chronic Illness	—	—	2	3
Public Administration	—	—	2	2
Social Anthropology	—	—	2	4
Other	na	6†	6†	12‡

* In reporting allocation of full-time faculty to departments of study, full-time professors in the university who give a major portion of their time to the school of public health are included, thus giving the total of 330 senior faculty.
† Includes two in venereal disease, one each in public health law and tuberculosis, and two unassigned.
‡ Includes four in administrative medicine, three in pathobiology, two in personal health, one each in medical bibliography, physical and occupational therapy, and radiation biology. These and the three preceding fields (chronic illness, public administration, social anthropology) indicate experiments in teaching—reaching out into new fields.

II. Assignment of Faculty Posts by Department of Study

One of the best indexes of teaching emphasis and of changes in teaching policy may be determined from the allocation of the full-time senior posts by department of study. This is shown in Table 2.

The most interesting aspect over the past ten years in development of curriculum is that the schools of public health have maintained a strong faculty for the basic elements of public health instruction. They have been imaginative in developing opportunities for student election of subjects thus opening new vistas that indicate future developments in public health. Noteworthy is the opportunity for study of social and economic factors that relate to community-wide responsibility for comprehensive medical care.

III. Budgets

The budgets of the ten schools have much more than tripled in the ten-year period. The effective teaching budgets have more than doubled but special research funds are five times as great currently as they were ten years ago. The figures are:

	1947-1948	1957-1958	
	10 Schools	13 Schools	10 Schools
Total	$2,910,000	$13,035,081	$10,208,128
Effective Teaching Budgets	2,132,000	6,519,524	5,489,596
Special Research Funds	778,000	6,515,557	4,718,532

In 1947-1948, three of the schools had no special research funds; the largest amount for any school was $332,000. In 1957-1958, the smallest special research budget was $86,000 and one school had research grants of over a million dollars.

A striking change is the emphasis on research in the programs of schools of public health during the past ten years. This is true of both intramural and field research. Grants have been readily available for studies from a great variety of sources. Some of the schools have become essentially "research institutes." In some schools there has been a trend toward limiting the student body to those who aspire to a doctoral degree and to shift the emphasis from teaching to graduate research.

This is not true of all schools. Those schools of public health in universities that are largely state-supported tend to develop a program that will prepare all categories of public health personnel for their future responsibilities. The endowed schools tend to be more restrictive in the breadth of their teaching program development and place more emphasis on depth.

IV. Facilities for Student Instruction and for Research

Ten years ago only three of the ten schools had limited facilities for their teaching and research programs. The other seven had reasonably adequate buildings and equipment; in fact, five schools possessed their own specially planned buildings and well equipped laboratories. This situation has now changed markedly. During the past ten years, two of the original schools and one of the new schools have built spacious and beautiful new buildings. Because

Table 3—Number of degrees granted by schools of public health by type of degree—academic years, 1947-1948 and 1957-1958

Degree	1947-1948		1957-1958	
	Number of Schools Giving Degrees	Number Receiving Degrees	Number of Schools Giving Degrees	Number Receiving Degrees
Total	—	472	—	817*
Dr. P.H.	4	11	5	7
Sc.D. in Hyg.	1	6	3	15
Ph.D.	1	1	1	1
M.P.H.†	10	377	13	644
M.S.P.H.	2	16	1	17
M.S. in Hyg.	2	6	3	26
M.H. Ed.	—	—	1	1
M. Hosp. Adm.	1	11	2	42
M.S. or M.A.	1	44	6	63
Cert. Med. Tech.	—	—	1	1

* In addition five schools reported undergraduate degrees or certificates to 139 students. Of these 98 were B.S.P.H.N. degrees; 17, C.P.H.; 14, L.H.; 6, C.I.S., defined as "record of studies" rather than a degree.
† D.P.H. in Montreal and Toronto Universities.

of rapid growth in research activities the remaining ten schools now have such inadequate facilities that this problem has become pressing and immediate. Some of the schools are planning or are actually constructing new facilities. Other schools have been compelled to disperse laboratories, classrooms, and other activities through scattered on-campus and off-campus buildings. It is clear that those schools that have obtained their own well equipped buildings have achieved a strong university status not enjoyed by the overcrowded, dispersed schools. In fact, public health teaching and research are just beginning to receive the consideration from the university authorities that they so richly deserve. It has been a long battle that is not yet won.

V. Degrees Granted

The degrees granted to graduate students by the schools of public health in the academic years 1947-1948 and 1957-1958 are shown in Table 3.

Table 3 indicates an increase of 70 per cent in the number of students awarded the M.P.H. degree in 1957-1958. This increase has occurred chiefly among candidates who presented "three years experience" as an entrance qualification (see Table 4). Master of science degrees in special areas have also increased. Some universities give an M.P.H. degree with special designation, for example, master of public health-hospital administration. Other schools may require an M.P.H. degree before the student may register for a degree in a special field.

There has been no increase in doctor of public health degrees awarded and but a slight increase in other doctorates. More students are enrolled each year in hospital administration, few of them with the M.D. degree.

VI. Entrance Qualifications for Master of Public Health Degree Candidates

The minimum entrance requirements that the American Public Health Association's Committee on Professional Edu-

cation has set for accreditation of schools for awarding the M.P.H. degree have not been changed materially during the past ten years. The text of these criteria follow:

Candidates to be admitted for the degree of master of public health (diploma of public health in Canada) may be either:

a. Holders of the degree of M.D., D.D.S., or D.V.M., or equivalent degree, from an acceptable institution; or

b. Holders of the bachelor's degree with adequate preparation in the sciences basic to public health, and also qualified in some professional capacity to pursue education in public health.

The latter qualifications may normally be fulfilled either by:

x. Professional academic qualifications in engineering, public health nursing, education, or some other field of public health representing the equivalent of at least one year of academic work in addition to the completion of a four years course leading to the bachelor's degree;

y. or experience (normally not less than three years) in some field of public health practice or in teaching of a type acceptable to the school.

A list of students admitted to schools in these categories is given in Table 4.

Table 4—Entrance qualifications of M.P.H. degree candidates, schools of public health—academic years, 1947-1948 and 1957-1958

Entrance Qualifications	1947–1948	1957–1958
Total	450	666
Doctors degrees (a)	249	310
M.D.	230	249
D.D.S.	12	33
D.V.M.	7	28
Bachelors degree plus (b)	201	356
Extra academic training (bx)	38*	18
Three year experience (by)	124	275
Extra academic training and experience (bxy)	39	63

* Of this group 17 were admitted to one school with only a bachelor's degree and no extra academic training; one had an engineering degree only.

This table indicates that the student body has not increased in proportion to the increase in faculty and budgets during the decade. The number of physicians who have applied for M.P.H. degree has not increased, which is a reflection of one of today's key problems in public health.

State-supported schools tend to admit a larger proportion of M.P.H. candidates who present the three-year experience qualification. In 1947-1948, of the 124 students admitted with the "bachelor's degree plus three years' experience," two-thirds were admitted to state schools; in 1957-1958, of the 275 so admitted, 83 per cent were in state schools. This is a logical development of this policy of state-supported schools to give adequate training to present and future state and local public health personnel.

VII. The Dr. P.H. Degree

During the past decade between ten and 15 students have received the Dr. P.H. degree for which two or more years of work are required. The number of Dr. P.H. degree candidates has not greatly changed in the ten years; 29 students in seven schools in the latter year, 20 in six schools in the former. Several of the schools do not offer the Dr. P.H. degree. There are now more candidates for the doctor of science and Ph.D. in public health fields than there are for the Dr. P.H. degree.

VIII. Courses Required of all M.P.H. Candidates

In 1947-1948, each school required students to take basic training in public health administration, biostatistics, sanitation, and epidemiology; all but three also required microbiology. Beyond this point there was great diversity of policy in required courses. One school provided no elective time; in most schools there was a wide range of electives.

Little change in basic policy has occurred during the last ten years. In 1957-1958, each school required basic training in public health administration, epidemiology, and biostatistics, and all but one in sanitation. Six schools did not require microbiology as a basic course.

The major difference is the development in several schools of a required course that might be called "human ecology." Such courses are an introduction to study of man and his environment, particularly in relation to community life. The courses have been developed differently in the various schools.

The schedule of elective courses available to students has had a striking development. Outstanding are courses in comprehensive medical care, hospital administration, general administrative principles, sociology, group dynamics, and so forth.

Several of the schools have developed special divisions of training, notably hospital administration and industrial medicine. These courses may lead to an M.P.H. degree or perhaps other university degrees. (It should be noted that several universities have developed training facilities in hospital administration and also in industrial medicine in university departments other than schools of public health.)

Several of the schools of public health also give extensive undergraduate public health training in addition to graduate teaching, but these students are usually registered in the undergraduate departments of the university and not in the school of public health.

IX. Field Training

During the decade, each of the schools has made serious efforts to develop a close relationship with active, effective official health services that are adjacent to the school. However, these facilities are not utilized by the schools for field training of students. In fact, none of the schools have assumed direct responsibility for field training of public health personnel. These facilities are used rather as demonstration areas, in which the "case teaching method" may be employed by instructors in much the same way that clinical medicine is taught to medical students. The whole question of field training of public health personnel, which is obviously an essential ingredient of public health instruction, has not been resolved. The schools of public health have agreed that such training is not their direct responsibility.

X. Research

An outstanding change in schools of public health during the past ten years is in the development of research. The extent of this growth is revealed, in part, by budget summaries. In 1947-1948, special grants for research totaled $778,000. In 1957-1958, this sum had reached a total of six and a half million dollars. Nor does this represent the total expenditure for research, since a large proportion of the basic budget of each school is also expended for research projects.

Many of the research projects are carried out in the field. Intramural research is extensive, but epidemiological studies may carry the investigator to all parts of the world. Some of the studies are socio-anthropological in character, that is, they involve "the behavioral sciences," emphasizing the study of man in relation to the health of his fellows and to his community rather than the biological control of disease. The unit of study is not the individual, but the community.

Some critics have contended that certain schools of public health are no longer institutions for instruction of public health personnel, but have become primarily research institutions,

with only a secondary interest in teaching.

The answer to this criticism is that sound imaginative research is the very life blood of any university. Schools of public health have an opportunity and obligation to attack new fields of research with regard to the health and welfare of mankind as related to the environment. The concentration of resources for research in schools of public health is an unmistakable trend and has created unlimited opportunities for the extension of knowledge.

XI. Consultation Services

Another somewhat unanticipated change has been the increasing demands upon the faculties of the various departments of the schools of public health to serve as consultants, particularly to governmental agencies. This is not limited to problems in epidemiology, public health administration, and sanitary science, but extends to such fields as biostatistics, maternal and child health, health education, industrial health, and others. These demands have been world-wide, and if fully met, would consume the entire energies and time of most of the faculty.

The need for these services is great and the benefits are obvious. The only questions that the consultant and his university must ask are: How great is this obligation? Does this service reflect advantageously or disadvantageously on the primary obligation of university teaching?

The ability to appraise a public health problem, and to give sound advice to the authorities about that problem is an essential part of the training and experience of one who aspires to a position on a public health school faculty. When he becomes a faculty member he should maintain his interest and activities in practical affairs of the world, thus increasing his value as a teacher as well. The degree to which he is called in consultation is a concrete index of his quality, and it is the obligation of the university to share his skill and experience with the community. Since public health is a community service, the public health faculty will be called in consultation more frequently than any other university department, with the possible exceptions of education and agriculture. It is now generally agreed by university authorities that it is highly advantageous to the university to provide skilled consultants in important community problems. But this policy often results in a heavy drain on the time and energies of key faculty personnel.

Summary

No striking changes have occurred during the past decade in methods nor general policies of schools of public health in so far as they relate to student instruction.

Admission requirements have not changed nor has the composition of the student body greatly changed. Candidates for the Dr. P. H. have not increased in number. The number of physicians registered for the M.P.H. degree has remained practically stationary. The increase in the student body has come largely in public health nurses, health educators, sanitarians, and other public health personnel who have had at least three years' experience in field work and who wish to study the theoretical aspects of the fields that they have been practicing.

The electives in the various schools offer a broader scope, with a trend toward greater emphasis on social and economic factors as they relate to public health affairs.

The major changes that have occurred during the past ten years are:

1. Tremendous growth in research activities. This has led to such overcrowding of facilities

that only three or four of the schools with large new buildings have been able to meet adequately the housing needs for their research projects.

2. The extraordinary demand that has been made on the faculty of the schools of public health to provide consultation services in various special health fields throughout their own states, the nation as a whole, and, in truth, throughout the world.

Dr. Smillie was professor of public health practice, retired, New York Hospital-Cornell Medical College, and has been accreditation consultant for the Committee on Professional Education since 1954. He now lives in Newfane, Vt. Miss Luginbuhl is research associate, American Public Health Association, and for a number of years was assigned some staff services for the Committee on Professional Education.

Training Nursing Home Aides

Following a plan worked out cooperatively among the three agencies, the Red Cross, the Public Health Service, and the American Nursing Home Association have announced that Red Cross nurse instructors will be authorized to assist in training nurses aides in nursing homes. Thus, the 25,000 public, private, and nonprofit nursing homes throughout the United States will be enabled to provide better nursing care for their 450,000 patients and to expand the training of their nursing aides. Presently, about a third of the homes employ neither a registered professional nurse nor a licensed practical nurse.

The textbook authorized for use in this new program is "How to Be a Nursing Aide in a Nursing Home." This was recently prepared by the Division of Nursing Resources of the Public Health Service and published by the American Nursing Home Association.

The authors of this paper present a rapid screening test for the detection of phenylketonuria, a metabolic anomaly associated with mental deficiency. This simple method can be used for surveys of large populations.

A NEW SIMPLE TEST PAPER FOR MASS DETECTION OF PHENYLKETONURIA

Joseph Wortis, M.D., F.A.P.H.A., and Antonio M. Giancotti, M.D.

SINCE PHENYLKETONURIA, a metabolic anomaly associated with mental retardation, can now often be beneficially treated with a phenylalanine-free diet, it has become desirable to detect its presence as early as possible, since the diet loses its efficacy as the child grows older. At the suggestion of one of us (J.W.) both the Lilly Research Laboratories of Indianapolis, Ind., and later the Ames Company, Inc., of Elkhart, Ind., developed test papers for the detection of phenylketonuria. These small strips of prepared paper may be used by immersion in a fresh urine specimen or by simple pressure against a wet diaper. The Lilly test paper* was released as RT 974 for clinical trial purposes only. The Ames reagent strips are being marketed under the name of Phenistix. The work reported in this paper was done with the Lilly material, but the Phenistix are almost identical in application. With the Lilly test paper the presence of phenylpyruvic acid in the urine produces a color change from the original yellowish white to a blue of varying density, depending on the amount of phenylpyruvic acid present. Amounts as small as 15-20 mg per 100 cc of urine are detectable by this method. The test is not, however, specific for phenylketone; the following substances may also induce color changes as follows: phenol, blue; pyruvic acid, red; paraaminobenzoic acid, red; salicylic acid, purple; hemogentisic acid (alkaptonuria), purple changing to brown. The formation of any color does indicate the presence of some abnormal metabolic product in the urine. With the Ames Phenistix the color change in the presence of phenylketonuria is green, but its sensitivity is otherwise similar. In all positive or doubtful cases, a regular ferric chloride or other confirmatory test on a fresh urine sample is done in our laboratory. False-positives may be found in children taking aspirin or Thorazine.

The test paper was distributed by mail, or handed directly to parents in our clinic, to a total of 1,600 families of retarded children. Six hundred of these cases had been treated in our clinic and 1,000 additional cases were contacted through the mailing lists of the New York Association for the Help of Retarded Children. The test paper was accompanied by a letter and a return postcard, both of which we reproduce herewith:

Dear Parent:

The Association for the Help of Retarded Children is assisting us in discovering cases of phenylketonuria, a form of mental deficiency. This kind of mental deficiency can now be treated successfully. This disease, however, is rare and can be found in less than one out of every hundred mentally retarded children. Early cases respond best to treatment. You can help us find children with this form of mental deficiency by means of a simple urine

* Made by Dr. J. P. Comer of the Lilly Research Foundation.

test which you can do yourself. But this paper test is only the first step in finding out if the child has the disease.

Dip the attached piece of paper into a small amount of fresh urine from your child, and see if the paper turns blue. It may take a minute for the color to change. It will fade away again in a few minutes.

Note the results on the enclosed postcard and return to us to complete your child's record. If you report "no change" or if the paper turns white, then your child does not have this particular disease and you will not hear further from us. If you report a color change or "doubtful," you will hear from us.

Sincerely yours,

Morris J. Solomon Clinic for the Rehabilitation of Retarded Children

NOTE: You can get a urine sample by catching the child's urine in a dish or bottle, or the urine can be squeezed out of a wet diaper. You can also place the paper inside the diaper until the child wets it himself, or you can press it against the wet diaper.

PHENYLPYRUVIC ACID TEST

Date .....

Child's Name .....

Age .....

Address .....

Result of paper test No change .....

Turned blue .....

Doubtful .....

Signed .....
(Parent)

In the first group of 600 cases known to our clinic, 440 postcards (73 per cent) were returned to us, with 12 doubtful results (2.72 per cent of 440), 428 negative results (97.3 per cent of 440) and two positive (0.45 per cent of 440). These two positive cases, of children aged six and seven, respectively, had already been diagnosed. The positive returns, however, confirmed the value of the testing paper as a screening procedure. The 12 doubtful cases proved to be erroneous interpretations by the parents, but in all these instances the urine was again checked in our own laboratory with negative results.

A second group of 1,000 families from the membership lists of the Association for the Help of Retarded Children produced 130 replies (13 per cent) with 130 negative results. Upon telephone inquiry to a random sample of 64 families from this group who failed to answer, we found that in four instances the parents could not be located. 10 families failed to answer for no good reason or because they claimed to have lost the slip, while 26 cases had already been known to the clinic and had already responded to our first survey. In all the remaining cases the patients had already been institutionalized (16 cases) or were so old (eight cases) that the parents thought the test would have no practical meaning for them. It would thus appear that this method of screening provided fairly complete coverage for the cases most likely to be helped.

The chief advantage of this screening device is that it can be carried out by technically untrained people at very little cost. We would therefore recommend that the test be widely used for similar surveys of large populations of retarded children, and that it be adapted by pediatricians as a routine test for infants at least one month of age, since the phenylketonuria may not be detectable during the first weeks of life. The widespread use of the test would furthermore help to support the view that mental deficiency may sometimes represent a treatable disease.

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A social scientist with a newspaper background undertook to study some of the factors involved in relationships between the people who write and edit medical news and those who are the sources of news—the public health officer and the practicing physician. The findings are presented and discussed in this paper.

THE PRESS, THE PHYSICIAN, AND THE PUBLIC HEALTH OFFICER

Roy E. Carter, Jr., Ph.D.

RESEARCH in mass communication has usually had one of two foci—audiences or content. Occasionally a researcher has concerned himself with communicators, and in a very few instances some attention has been given to the "gatekeeper" role of the reporter or editor who decides what the public shall read. Ordinarily, however, the "gatekeeper" has been studied in vitro rather than as an individual who interacts with news sources. Similarly, students of the social aspects of medical practice seem to have given little attention to the medical man's relationships with the mass media.

Recently, in North Carolina, I completed a two-year study of relationships between physicians and newspapermen. The project included (a) intensive interviews with 43 physicians (including five health officers), 29 newsmen, and 13 hospital administrators in four widely separated counties; and (b) state-wide mail questionnaire studies involving 73 newspaper editors, 110 local medical society officers and public relations committee chairmen, and two probability samples (210 physicians) of the general membership of the state medical society. Response rates to lengthy questionnaire materials ranged from 70 per cent to 88 per cent, with no evidence of any significant biases from nonresponse. I also carried out extensive analyses of what physicians and newsmen have said about one another in professional and trade journals, and I studied nearly 1,800 medical news items appearing in North Carolina newspapers. The study was supported by a grant from the Medical Society of the State of North Carolina.

This article summarizes interview and state-wide questionnaire data from the press-medical study, as supplemented by parallel information obtained in the fall of 1957 from 27 students in the public health administration course in the School of Public Health, University of North Carolina.

Nine of these respondents were physicians, five were nurses, four were dentists, two were veterinarians, and seven others were public health workers whose professional training was in fields ranging from civil engineering to law and statistics. Where responses of nonphysicians differ from those of the M.D.'s in the class, they are reported separately below.

One noteworthy finding was the degree to which the opinion data from the public health students (physicians and nonphysicians alike) resembled the responses of the state-wide sample of North Carolina physicians. This was particularly interesting in view of the

fact that the students came from a dozen different states. (Data from foreign students were excluded from the analysis.)

Setting of the Research

The purpose of the main press-medical study[1] was the development of a body of factual data about the opinions and experiences of physicians and newsmen in the field of medical news. Many state and local medical societies have sponsored press-medical conferences or have developed codes of cooperation with the mass media. What made the North Carolina program unique was the belief that a fact-gathering effort should come first.

Material from the public health administration class was gathered during an instructional unit devoted to public relations and the mass media. Journalism staff members served as guest lecturers in a series of sessions in a class taught by Drs. Charles M. Cameron, Jr., and John J. Wright. Edgar Crane, lecturer in journalism, served as coordinator for his school. Almost all of the students were persons with substantial experience in public health work.

The Physician as a News Source

The medical man's code of ethics sets up clearance procedures providing a measure of professional control over his function as a news source. Yet a substantial proportion of the general North Carolina medical sample (29 per cent) indicated they believed that decisions concerning the ethical aspects of providing information to the mass media should be left up to the individual physician. Editors and reporters who were interviewed made frequent references to physicians' "fears of what other doctors will say or think," and a number of doctors with whom I talked expressed concern over their colleagues' responses to what appeared in print. Apart from the fact that the medical man may be accused of seeking publicity if he is quoted by name in print, there is also the possibility that he may be criticized on scientific or technical grounds if a reporter oversimplifies or abridges what the physician has to say.

Data from three different samples (total size 232) and two different types of measure (rating scales and item order in a cumulative attitude scale) made it quite clear that among physicians in North Carolina the performance of newspapers in the area of health and medical news is regarded as more fair than accurate, and more accurate than complete. The public health group responded in a similar way, but the differences in this small sample could have occurred once in four times by chance.[2] By the same statistical test, the statewide differences could have occurred by chance only once in a thousand times.

My North Carolina interviews and my more general review of press-medical literature suggest that the physician in private practice may be criticized by his colleagues if what he says is publicized, and that occasionally a newsman may seek information which, if given, would violate the doctor-patient relationship. In contrast, interviews with five North Carolina health officers and with experienced public health people in the public health administration class indicate that the health officer is a public official with affirmative goals in the field of health education which often can be met only through the mass media. Certainly the public health people who were questioned had more press contacts than their practicing-physician counterparts in North Carolina and reported greater success in inducing newsmen to "play back" their notes or to show them items before they were published.

Newsmen feel they have good reasons for their reluctance to permit a news

source to read articles before they are printed: Deadlines get in the way, and some news sources may try to extend the check on accuracy to include dictation of how a story is to be written or presented. The reporter usually regards himself as a professional person with special competency in writing.

It is less easy to understand why fewer than half of the 73 newsroom supervisors in the North Carolina sample were in favor of the practice whereby a reporter reads or "plays back" his notes to a news source to make sure the newsman has his facts straight. Interestingly, the degree to which editors were willing to accept the "playback" procedure was a statistically significant correlate of the extent of belief among editors that press-medical relations were improving and of the perception by editors of similarity in the medical news goals of newsmen and medical news sources.

Among doctors who served as news sources, those who reported that the newsmen with whom they dealt followed the "playback" procedure had more favorable impressions of the performance of newspapers in the medical news field than those held by colleagues who did not encounter such safeguards against inaccurate reporting. The procedure itself is one which most journalism teachers and many editors try to instill in reporters, even in less technical fields than medical and health news. (All of these "playback"-related response patterns met criteria of statistical significance. The differences reported among the editors could have occurred by chance only from two to five times in one hundred, and the odds against the findings in the medical sample resulting from sampling error are greater than one thousand to one.)

Interview data and sociopsychological theory led to the belief that physicians who served as medical news sources would have more favorable attitudes toward the press than their less experienced colleagues, and this was indeed the case. Service as a medical news source was significantly related to scores on an attitude scale, rating scales, and other measures used to assess the degree to which physicians looked with favor upon newspaper treatment of medical news. No evidence was found of any systematic selection procedure whereby physicians who have warm feelings toward the press are cast in a news-source role by their colleagues. Instead, at least a partial case can be made for frequency of contact as a causal factor in attitudes toward the press.

A similar pattern held true for the public health class, but the differences in this small sample could easily have occurred by chance.

Public Health Officials and the News

More than half of the 70 North Carolina editors who responded to a questionnaire item about city-county health officers in their areas described the latter group as "very helpful," and an additional third rated the health officer as "fairly helpful."

Every newsman who was interviewed in the four North Carolina medical society areas in which I conducted interviews had praise for his local health officer, and gave a generally favorable response to the interview guide question, "In general, how would you characterize the city-county health officer as a news source?"

When the 73 North Carolina editors in the state-wide sample were asked to rank six news source groups in terms of their cooperativeness with the press, there was significant agreement on the following order: Law enforcement officers (most cooperative); local (city and county) government officials, school administrators, local merchants, hospital administrators, and physicians (least cooperative). The favorable reactions of

interviewed newsmen to questions about city-county health officers are thus congruent with the hypothesis that the health officer was perceived mainly as a government official, not just as a physician.

Although a few physicians in the general sample in North Carolina voiced some objection to the volume of health and medical information provided to the press by public health officials, no interviewee claimed that the local medical society had any "right" to control the health officers' utterances. All, in other words, took the position that the health officer, in his role as a medical news source, functioned primarily as a public official rather than as a physician subject to intraprofessional controls on "publicity."

The experienced public health people in the public health administration class differed as a group from the North Carolina physicians in the degree to which their press contacts involved personal visits rather than telephone calls. More than half of the general medical sample's recent interaction with newsmen took place via telephone, whereas in the case of the public health group 85 per cent of the contacts involved personal calls by reporters. This difference stems in part, of course, from the fact that the health officer is on the reporter's "beat" in most communities, simply by virtue of the location of the health department office. Beyond this, however, the public health person may initiate press contacts himself.

Members of the public health administration class who had worked in the public health field reported more press contacts than were experienced by the officers and public relations chairmen of North Carolina medical societies —the most "active" medical sample in terms of press relations. Most of the public health class members had initiated news items themselves during their last year in public health work, and a full half of them had made radio or television appearances, or both, during that same period. Many of the news stories had to do with routine news about the work of the news source or of his agency or organization, but more than a fourth of them dealt with other community activities of these same public health people.

When asked in detail about the last news items they remembered furnishing to the press, the public health class members indicated that they were quoted by name—or would have agreed to be quoted—five-sixths of the time.

Goal Differences and Similarities

During my interview work with newspapermen and medical news sources in North Carolina I developed a list of five much-talked-about goals or values which a newsman or a medical news source may be concerned with in connection with medical news items. In the later questionnaire studies each physician and each editor was asked to rank the goals, first in terms of their importance to him, and second, in terms of their supposed importance to members of the other group. From these sets of rankings it was possible to derive individual and group measures of the goal differences perceived by doctors and by editors.

Table 1 shows the over-all rankings[3] accorded the goals by each group, as supplemented by data provided by the 27 public health students. Responses of North Carolina physicians and the public health group were not pooled or "averaged" indiscriminately. Actually, both groups ranked the goals in exactly the same way, and both groups ascribed identical rank patterns to newsmen.

Column A of the table indicates the way in which physicians and public health people ranked the goals, and column B shows the way these same groups felt the goals would be applied

by newsmen. Similarly, column C indicates the rank order which editors believed physicians would apply, and column D reflects editors' own stated opinions of the relative importance of the goals.

Editors believed their goals in handling medical news were similar to those of physicians, whereas medical men saw considerable disparity between the groups. For example, 81 per cent of the physicians rated accuracy in first place, whereas only 6 per cent of these same medical men attributed a number-one ranking to this goal in the newsman's value scheme. The physicians perceived newsmen as putting interest to readers and promptness of publication ahead of the other goals.

The rank-order correlation between column A and column B, on a scale of −1.00 to +1.00, is −0.50. This is a measure of the dissimilarity in the order preferred by doctors and the order they ascribed to editors. The corresponding figures for columns C and D, a measure of the similarity which editors saw in their own values and those of medical men, is +0.62.

Just as the public health students ascribed the same set of values to the newsman as were attributed to him by physicians, so the North Carolina editors were able to predict correctly the way in which the goals would be ranked by medical men. Columns A and C are identical.

How reliable and valid are the rankings? First of all, it should be pointed out that these are stable data, based on levels of agreement[4] far in excess of those needed to meet the most stringent criteria of statistical significance. Moreover, several of the differences reflected in the group rankings are extremely large.

The editors and physicians were representative and unbiased samples of the populations from which they were drawn in North Carolina, whereas the public health group was made up of students who happened to be enrolled in a single public health administration class at one university. The identity of the rankings made by this group and of those made by the North Carolina physicians suggests that in the health field there may be a common pattern of goals regarding medical news and a shared image of the newsman as someone who "compromises" with deadline pressures and with the public's appetites, as apart from societal needs.

It is interesting, however, that the editors perceived themselves as having a value scheme similar to that of the physicians and public health people. A medical critic of the press might argue that the editors paid lip service to accuracy, yet in a day-to-day work situa-

Table 1—Physicians' and editors' goals in medical news coverage*

Goals	Physicians and Public Health Administration Students Rank		Editors Rank	
	Selves (A)	Editors (B)	Doctors (C)	Editors (D)
Accuracy	1	3	1	1
Interest to readers	4	1	4	2
Usefulness to readers	2	4	2	3
Prompt publication	5	2	5	4.5
Completeness	3	5	3	4.5

* These rankings are based on data provided by 213 North Carolina physicians, 54 North Carolina editors, and 27 public health administration students.

tion might behave quite differently. Also, he might suggest that there are few if any pressures on the physician to apply the goals in any order different from the one he provides in filling out the questionnaire. There seems to be some "face validation" of the newsmen's ranking, however, in the fact that they conceded (1) that interest to readers was more important to them than to physicians, and (2) that completeness was more important to doctors than to themselves. Another possible indication of validity, perhaps, lies in the fact that daily paper editors—who are under deadline pressures—ranked promptness of publication ahead of completeness. (The daily-nondaily difference explains the tie in column D of Table 1.)

The ability of editors to predict correctly the way in which physicians ranked the values is not too surprising. Most editors work with medical news sources, whereas many physicians have very limited contacts with newspaper people. The highest agreement level in any of the sets of rankings was that of the editors concerning the medical man's value scheme.

That members of the medical profession are themselves aware of the kinds of difference in goal perception reported here is suggested by some recent remarks by the then president of the American Psychiatric Association: "Probably writers and other communications specialists find doctors among the most difficult of all professional people with whom they must deal." Later in his talk the speaker added that such difficulties usually "appear to stem from a conflict in goals and objectives."[5]

Intergroup Images

One of the basic problems dealt with in the press-medical study was the question, how do medical men perceive newsmen and how do newsmen perceive physicians? Concern with this kind of variable stems from the sort of thing sociologist Charles H. Cooley had in mind, a half century ago, when he observed that "the imaginations which people have of one another are the solid facts of society."[6]

Data of the images each group had of the other were gathered by means of psychologist Charles E. Osgood's "semantic differential," a measurement procedure based upon a series of studies of the dimensions of meaning.[7] Each physician and each editor filled out a scale booklet in which he rated eight occupation groups—physicians, hospital administrators, newspaper editors, newspaper reporters, radio-television newsmen, magazine medical writers, attorneys, and bookkeepers on a series of seven-step scales. The last two occupations were included to help provide a frame of reference for the interpretation of answers. Respondents were asked to mark the scales in terms of their general impressions of the people making up each group.

Members of the public health administration class filled out similar rating sheets, but for only three occupation groups—public health officer, reporter, and editor.

Table 2 shows the rank order accorded eight occupation groups on four of Osgood's "evaluative" rating scales (good/bad, valuable/worthless, honest/dishonest, and fair/unfair). It was hypothesized that each group would perceive itself most favorably and that the second highest ratings, in each case, would go to the most closely allied group (hospital administrators where physicians were the raters and reporters when editors were doing the rating). This is exactly what happened. It was also predicted that physicians, because of status differences and other factors, would tend to accord higher evaluative ratings to editors than to reporters. (It is the reporter, not the editor, who vexes the physician with "unreasonable" re-

Table 2—Occupation group rankings from analysis of variance by ranks, editors and physicians (combined samples) as raters

Group	Rank on Evaluative Rating Scales	
	Physicians as Raters*	Editors as Raters†
Physicians	1	3
Hospital administrators	2	4
Bookkeepers	3	5
Newspaper editors	4	1
Radio-TV newsmen	5	6
Newspaper reporters	6	2
Attorneys	7	7
Magazine medical writers	8	8

* Data from 240 North Carolina physicians.
† Data from 46 North Carolina newspaper editors.

quests for information.) This hypothesis also was confirmed by the data.

The predicted differences for the physicians (the larger group) meet stringent criteria of statistical significance—the probability of chance occurrence is less than one in ten thousand—and the odds are from 33 to 50 to one against the findings in the small sample of editors being a result of sampling error. Overall, the differences within each group were significant at the one-in-one-thousand level. (The tests used were Chi-square for analysis of variance by ranks, and the sign test. Each "score" in the analysis was the summed evaluative ratings of one group by one respondent.)

Osgood, in his study of the dimensions of meaning, located two major factors apart from the "good-bad" or evaluative dimension. These are strength ("potency") and "activity." The strength or "potency" dimension is represented by rating scales like strong-weak and rugged-delicate, and the "activity" factor is represented by scales like fast-slow and active-passive. Taken together, the three factors account for a major share of the verbal judgments people make in our society. Consequently, the differences in profiles of the occupation groups across rating scales drawn from all three dimensions is a useful measure—in a general sense—of how alike or different these groups were perceived to be.

When this method of analysis was used in the present study[8,9] the results paralleled those obtained when only the "good-bad" scales were used. With physicians as the raters, for example, editors were perceived, not only as "better" than reporters, but also as more rugged, stronger, and more active. Furthermore the profiles for editors (as rated by medical men) were more like those of physicians than were the profiles of reporters. The physicians, in other words, perceived editors as relatively like themselves, whereas reporters were seen in a less favorable light. Again, the findings met rigorous criteria of statistical significance.

The reader, in interpreting Table 2, should know that the relatively low rankings accorded certain groups (e.g., magazine medical writers, attorneys) were not low in an absolute sense. Most raters (editors and physicians alike) tended to make use mainly of the more "favorable," "stronger," or more "active" halves of the scales. Only in a relative sense, then, did either the physicians or the editors criticize any occupation group.

That the reporter and editor fared less well than the bookkeeper in the over-all ranking is not too surprising. In a national study of people's perceptions of social status in 1947,[10] the reporter for a daily newspaper emerged with a "general standing" index just a shade below the ratings accorded undertakers, electricians, and machinists, and barely above that of the bookkeeper. Physicians, in contrast, were second from the top of the list, next to Supreme Court justices.

The relative ratings accorded radio-television newsmen, newspaper reporters,

and magazine medical writers are consonant with answers physicians gave when they were asked to rank the mass media in terms of their performance in handling material in the field of health and medicine. Identification of the radio-television person as a "newsman" suggests a reportorial role and perhaps accounts for the rank midway between the editor and the reporter in the evaluations made by physicians. Much radio-TV material in the health-medical field is, of course, program content of a general educational nature, not "news."

Members of the public health administration class rated public health officers as more valuable, good, and so forth, than editors, and editors in turn were given higher ratings than those accorded reporters. The result was congruent with the pattern of rating-scale responses which emerged when North Carolina physicians were the raters.

Summary

In an effort to isolate some of the variables and problems in relationships between the press and medical profession in North Carolina, interviews were conducted in selected counties and supplementary state-wide surveys were carried out by mail. Parallel data were obtained from members of a public health administration class at the University of North Carolina.

Interview and questionnaire data suggest that physicians in private practice and public health officers differ in their problems as medical news sources. In particular, the latter group appears to be subject to fewer intraprofessional restraints on "publicity." North Carolina editors had generally favorable impressions of the health officer as a medical news source.

The practice whereby a reporter "plays back" his notes to the medical news source to insure accuracy was significantly correlated with favorable attitudes toward the press on the part of physicians. Physicians who served as medical news sources had relatively favorable perceptions of newspaper performance in the health and medical news field.

North Carolina physicians rated editors as persons relatively like themselves on a number of attributes, but reporters —the newspapermen with whom they ordinarily must deal—were seen as less valuable, less fair, and less honest. Editors believed that their news-related goals and those of physicians were similar, but members of the latter group held that there were real differences—that newspapermen put promptness of publication and interest to readers ahead of accuracy and societal needs.

In general, the attitudinal responses of the relatively heterogeneous public health class made up of students from several states paralleled the answers of the North Carolina medical sample.

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Part of the present article is drawn from a paper read August 29, 1957, at the annual meeting of the American Sociological Society, Washington, D. C.

The frequency and age distribution of cases of hepatitis in Syracuse, N. Y., exhibit a striking correlation with socioeconomic elements. This phenomenon is studied in the following report and its implications are discussed.

THE INFLUENCE OF SOCIOECONOMIC FACTORS ON THE DISTRIBUTION OF HEPATITIS IN SYRACUSE N. Y.

George S. Goldstein, M.D., and Paul F. Wehrle, M.D.

HEPATITIS IS an important cause of illness, both in civilian and military populations. In addition to the frequency of the disease, the extent of disability resulting from this illness has been disproportionately large when compared with many other infectious agents due to the protracted convalescence characteristic of hepatitis. In some military units it has been found to be the greatest cause of disabling illness.[1]

It is not yet possible to identify the etiological agent or agents of either hepatitis A or B (infectious or serum) in the laboratory, and no reliable serological test is available to indicate previous experience with these agents. It is therefore necessary to use epidemiological technics to study the disease in a given locality in order to establish presumptive evidence of the prevalence of the types of hepatitis and to direct control measures intelligently.

The present study was initiated with two objectives in mind. The first was to obtain further data on the relationship of socioeconomic status to the prevalence of the disease. The second objective was to determine the relative importance of hepatitis A (infectious) and B (serum) in Syracuse, N. Y. While the latter objective represented a relatively routine analysis to guide control measures, the relationship of the clinical disease to multiple socioeconomic factors seemed desirable in order to provide more basic information regarding the transmission of the infection. Since the virus of hepatitis A has been demonstrated in the feces of clinical cases in human volunteer experiments[2-4] and since there is marked familial aggregation of cases,[5-7] it seems reasonable to expect that conditions associated with poor hygiene and crowding may favor transmission. This is also suggested by an observed association of the disease with unsanitary living conditions[8] and the correlation, during an epidemic, of higher case incidence with poor living conditions in three different socioeconomic divisions of two large cities.[9,10] Therefore, it seemed desirable to establish the extent of this correlation, using multiple population groups over a period of several years.

Materials and Methods

The cases included in this study were obtained from two sources: Syracuse City Hospital (both private and ward

Table 1—Cases of hepatitis reported to Syracuse City Health Department 1953 - 1957

Age in Years	Year					Total
	1953	1954	1955	1956	1957	
0–14	95	103	26	9	10	243
15–39	64	91	30	25	22	232
40+	13	46	25	13	7	104
Total	172	240	81	47	39	579*

* Includes cases reported from adjacent areas.

services, 116 case records) and the Syracuse City Health Department (463 case records).* The latter group included cases from the Syracuse metropolitan area as well as from the city itself. Cases from other Syracuse hospitals as well as patients treated at home are included in this latter group. Data were obtained from these 579 case records regarding age, sex, race, address, and census tract in the city or county, previous inoculation history, hospitalization within six months, and potentially hepatotoxic medication.

Socioeconomic data dividing the city into six categories were provided by Dr. Charles V. Willie of the Department of Preventive Medicine of the State University of New York, College of Medicine in Syracuse. The divisions were by census tract and were based on family income, education, occupation, median home valuation, rental cost, and other factors.[11]

Results

The cases reported for each of the years from January, 1953, through December, 1957, are recorded by year and age group in Table 1. Since this disease was not reportable in Syracuse until 1952, the data prior to this year are incomplete. It should be noted that during the years of high incidence, 1953 and 1954, the disease was most prevalent among the zero to 14-year age group, while in the other years the 15-39 age group appeared to be involved most frequently. Whether this represents a valid change in the age involvement or simply reflects more complete reporting of the characteristically milder cases among young children during periods of high case incidence is not clear. The decreased incidence among persons 40 years and older is consistent in all years.

In regard to race, 11 patients were Negroes and seven were American Indians. The proportion of the clinical disease in these groups was only slightly less than would be expected from the proportion (<5 per cent) of these groups in the community.

The age distribution and age-specific rates for all of the cases are presented in Table 2. The cases ranged in age from six weeks to 80 years. The highest age-specific attack rate occurred in the school-age children from five to 14 years of age. There also appeared to be a secondary wave of increased frequency of cases in the 30 to 39-year age group when compared with the age groups immediately above and below. This group, it is interesting to note, represents the age group of the parents of children in the ages of most frequent involvement and has been noted previously.[10] With regard to sex, no sig-

* Made available by Dr. A. C. Silverman.

Table 2—Age distribution of hepatitis cases, Syracuse, N. Y., 1953-1957

Age Group Years	Total	
	Cases	Rate*
0–4	23	116
5–9	91	622
10–14	73	625
15–19	24	159
20–29	74	183
30–39	78	245
40–49	43	156
50–59	23	87
60+	9	29
Total	438†	200

* Rate per 100,000 based on 1950 census data.
† Does not include cases from adjacent areas.

nificant difference between the incidence in males and that in females appeared in this study.

In some other infectious diseases, for example tuberculosis and poliomyelitis,[12-15] it has been shown that factors associated with the socioeconomic status of a population may have an important influence on the prevalence of the infection. This also appears to be the case in hepatitis.

Table 3 illustrates the characteristics used to determine six graduated socioeconomic divisions within the city of Syracuse, N. Y. Area I is the highest socioeconomic level in the city and Area VI the lowest and it can be seen that, with one minor exception, the characteristics studied follow an orderly progression in all groups. Each patient was placed in one of these six socioeconomic divisions depending upon his or her census tract within the city.

The correlation of socioeconomic status with the hepatitis rate is illustrated in Table 4. Noteworthy here is the regular progression of increasing rates of hepatitis with decreasing socioeconomic status, with the exception of Area I where relatively few cases were reported.

It is apparent in Table 5 that, although the case rate is higher among lower socioeconomic levels, when cases at all ages are considered the age-specific rate in lower group adults is lower. The ratio of children of ages zero to nine years to adults of 30 years and over in the total population of the groups studied was approximately 1:3 as noted. This suggests that differences in age distribution do not influence this result. The increased total case rate in the lower groups is, therefore, dependent upon a considerably higher rate in children as recorded in Table 5. Although not shown here, there was also an orderly

Table 3—Characteristics of six socioeconomic areas studied,* Syracuse, N. Y.

Area	Individual Home Valuation	Rental Unit Cost	Adult Schooling (Years)	Service and Laborers (Per cent)	Proportion of City (Per cent)
I	$19,300	$80	12.7	9	3.5
II	14,100	54	13.1	14	11.5
III	10,500	51	11.8	23	14.4
IV	9,800	47	11.3	29	21.0
V	8,300	41	10.1	39	22.0
VI	6,800	34	8.7	51	27.0

* Data provided by C. V. Willie, Ph.D.

Table 4—The influence of socioeconomic factors on hepatitis rate, Syracuse, N. Y., 1953-1957

Area	Cases	Population	Rate*
I	16	7,800	205
II	31	25,300	123
III	45	32,000	141
IV	72	46,000	157
V	89	49,000	182
VI	185	60,000	310
Total	438	220,100	199

* Rate per 100,000 based on 1950 census data.

Table 5—Hepatitis cases and rates in youngest and oldest age categories in various socioeconomic groups

Socioeconomic Area	Age Group (Years)	Hepatitis Cases	Population*	Rate/100,000
I & II	0–9	12	5,017	240
	30+	28	15,170	187
III & IV	0–9	16	12,418	129
	30+	60	42,623	141
V & VI	0–9	86	17,115	505
	30+	65	57,878	117

* 1950 census data.

Table 6—Type of contact, hepatitis cases, Syracuse, N. Y., 1953-1957

Sources and Types of Contact Described	Source of Cases Studied					
	City Hospital 116 Cases		Other 447 Cases		Total 563 Cases*	
	No.	Per cent†	No.	Per cent†	No.	Per cent†
None	32	27.5	73	16.3	105	18.6
School	4	3.5	1	0.2	5	0.9
Neighborhood	29	25.0	94	20.2	123	21.2
Family	28	24.1	48	10.8	76	13.5
Community	49	42.3	371	83.0	420	74.5
Total cases	116	——	447	——	563	——

* An additional 16 cases had insufficient information for classification.
† Do not add to 100 per cent due to possible multiple types of contact.

Table 7—Types of contact by socioeconomic area, Syracuse, N. Y., 1953-1957

Areas	Family		Neighborhood		Community		Total
	No.	Per cent	No.	Per cent	No.	Per cent	
I & II	0	0.0	2	5.0	38	95.0	40
III & IV	15	12.6	19	16.0	85	71.4	119
V & VI	44	12.4	98	27.6	214	60.0	356

progression of decreasing proportions of cases 30 years and over in socioeconomic Areas I through VI. These older groups represented 61, 52, 50, 47, 36, and 18 per cent of all cases reported in socioeconomic Areas I-VI, respectively.

Table 6 illustrates the various types of "contact" recorded in these cases. School contact is recorded if the present case was preceded by another in the same school within a 30-day period. This is probably incomplete, as the parent or physician is not likely to know of other school cases. Neighborhood contact indicates that other cases have been reported within a three-block radius of the present case within one month prior to onset. Family is self-explanatory and community contact is recorded if other cases were reported within the same census tract within one month. The neighborhood and community type of occurrence of this disease is apparent and lends support to the previously described pattern of local dissemination. Only one-third of hospital and one-fifth of total cases did not show this pattern.

Investigation of possible etiological factors was undertaken. Of the City Hospital cases studied, only two or 1.9 per cent were found to have a history of prior inoculation (within six months) of blood or blood products. An additional 15, or 12.8 per cent, of these cases gave some history of inoculation (materials other than blood or its products) within six months prior to illness. This suggests that serum hepatitis was not an important cause of hepatitis in the overall picture. Only two cases of leptospirosis (not included here) were recognized in this area during this period, and less than 2 per cent of the cases recorded gave histories of ingestion of known potentially hepatotoxic drugs.

In Table 7 the types of contact by socioeconomic area are summarized. Family and neighborhood types of contact appear to be somewhat more prevalent among the lower socioeconomic areas, while a more diffuse "community" distribution of the cases appeared among the higher areas. While differences in gamma globulin usage may influence this type of distribution, it seems equally likely that hygienic factors may be important.

The over-all case fatality rate of 1.6 per cent, as seen in Table 8, is somewhat higher than the frequently quoted figure of 0.5 per cent. This may be explained in part by both the age distribution of our cases and by less complete reporting.

Table 8—Hepatitis case-fatality rates by age, Syracuse, N. Y., 1953-1957

Age (Years)	Hepatitis Cases	Deaths	Fatality Rate (Per cent)
0–9	114	0	——
10–19	97	0	——
20–29	74	0	——
30–39	78	1	1.3
40–49	43	1	2.3
50–59	23	3	13.0
60+	9	2	22.2
All ages	438	7	1.6

particularly during nonepidemic years. In addition, errors in diagnosis (particularly confusion with malignancy) may also cause a spurious increase in mortality rates, especially among the older age groups.

Discussion

Two of the factors which may influence the validity of the present study are frequency of reporting and the use of gamma globulin among case contacts. Reporting of hepatitis has been required since 1952. Red Cross gamma globulin has been supplied free of charge by the Health Department for family prophylaxis for reported cases. Therefore, since obtaining gamma globulin requires case reporting, it seems reasonable that hepatitis is reported as completely as any other prevalent infectious disease, with the possible exception of poliomyelitis.

The comparative frequency of gamma globulin usage among family contacts of cases in the various socioeconomic groups in this series is unknown. It appears likely that families in all socioeconomic groups have ready access to gamma globulin, since Health Department child health clinics, the dispensary, and visiting public health nurses have been aware of its availability and have provided ample facilities for administration as have the private physicians. It should be recalled, however, that evidence of greater gamma globulin utilization in higher socioeconomic groups has been observed by several investigators.[9,16] Although the extent of usage cannot be precisely determined, it seems unlikely that possible variations in usage of this agent would explain the wide difference in rates and the associated changes in the age selection observed, since some of the possible bias introduced would be expected to produce changes contrary to those observed.

The correlation of hepatitis incidence with socioeconomic status in Syracuse seems well established. With the exception of the highest area where only 16 cases were reported, there was an orderly stepwise increase in total hepatitis prevalence with each succeeding lower socioeconomic area studied. It is interesting to note that the source of domestic workers in the highest economic area is most frequently the lowest area, thus offering another (in addition to small numbers) explanation for this exception to the orderly progression.

When age-specific rates are considered, the prevalence of hepatitis is considerably greater among the zero to nine-year age group in the lower socioeconomic groups. In spite of this increase in the rate among children in the lower divisions, which is responsible for the total rate difference observed, there is a progressive decrease in the rate among persons 30 years of age and older in the lower socioeconomic areas. This decrease is also apparent in the orderly decline in the proportions of total cases 30 years of age or older from 61 per cent in Area I to 18 per cent in Area VI. There is no apparent reason to expect differences in case reporting among various ages in the different socioeconomic groups. In addition, the child-adult ratios in the general population were essentially similar for all socioeconomic groups on the basis of 1950 census data.

The most reasonable and indeed the only adequate explanation for these differences in rates and ratios is an increased prevalence of the infection in the lower socioeconomic areas. This increased prevalence of the infection is indicated by considerably increased clinical illness among younger persons and this appears to be associated with a higher level of immunity in the corresponding adult population, at least as measured by a lower clinical attack rate in adults in spite of heavier community exposure in the lower socioeconomic areas.

Although serological technics are not yet available for hepatitis A, the similarity to the distribution of clinical poliomyelitis cases is striking. The correlation of the age distribution of clinical cases of poliomyelitis with socioeconomic status and age-specific rates of prevalence of neutralizing antibodies[13-15] indicates that prevalence of antibodies and socioeconomic status seem to be inversely related. It is known that more primitive populations and those groups with poorer socioeconomic status are more likely to acquire poliovirus neutralizing antibodies at an earlier age. In addition, increased prevalence of infection, as measured by more frequent antibody presence, has been correlated with a predominance of clinical disease among young children, while diminished prevalence of infection is associated with a wider age range among the cases and more frequent illness among older persons. One might anticipate that resistance to clinical hepatitis will be developed earlier and will be more uniform among the lower socioeconomic groups, if this similarity is valid. In addition to this experience, this similarity to poliovirus infection has also been suggested by the Des Moines epidemic experience,[9] where higher attack rates and younger clinical cases were noted among the lower groups. A difference in immunity among adults was previously suggested by higher attack rates among officers than enlisted men in a military experience.[1]

These data suggest that little clinical serum hepatitis has occurred in Syracuse recently. Only 1.9 per cent of the City Hospital cases gave a history of prior administration of blood or blood products, and it is not certain that in even this small proportion the disease actually represented hepatitis B. There has also been nothing to suggest that leptospirosis has been present in more than an occasional case not included in these tabulations.

Finally, the increased case-fatality rates observed in older persons must be regarded with considerable caution. Although the severity of the clinical disease appears to increase with age,[17,18] other factors such as unrecognized malignancy and fatal liver disease due to other causes may enter and give a false impression of a higher fatality rate among older persons. Since three autopsies were performed among the seven deaths, with findings consistent with hepatitis, this offers some assurance that at least part of this increase is valid.

Summary

The hepatitis experience of Syracuse, N. Y., has been reviewed using hospital and Health Department records. The hepatitis appeared to be consistent in most cases epidemiologically and clinically with hepatitis A. Only 1.9 per cent of the City Hospital cases had a history of administration of blood or blood products within six months of admission. A striking correlation was observed between socioeconomic area in the community and both the frequency and age distribution of the cases. Higher total case rates and higher rates among children were observed in the lower socioeconomic groups, while the adults in these categories had lower clinical hepatitis rates in spite of heavier community and family exposure. It is suggested that the prevalence of this infection may be favored by factors such as crowding and the poorer hygiene and sanitation often found in the lower socioeconomic groups. These factors may result in more frequent infection of children with a resultant greater immunity of adults in these circumstances.

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Ten Years of Hill-Burton

In "The Nation's Health Facilities" the Division of Hospital and Medical Facilities of the Public Health Service reviews the history and accomplishments of the Ten Years of the Hill-Burton Hospital and Medical Facilities Program. In the building of hospitals and nursing homes for inpatient care and in public health centers, diagnostic or treatment centers, and rehabilitation facilities, nearly two and one-half billion dollars was spent, less than one-third of which came from federal funds.

There are two chapters on the evolution of health facilities and on the nature and results of the Hill-Burton program. Among the "notable indirect effects" of the program is the example and experience in cooperation between government levels, the development of licensure laws and minimum standards for hospitals and nursing homes, and the stirring of community interest and community responsibility for health facilities. Public Health Service Publication No. 616, Government Printing Office, Washington 25, D. C., $1.25.

The importance of evaluation in public health work is underscored in this paper. The author analyzes the various aspects and components of evaluation and applies his analysis to environmental sanitation.

SURVEY AND EVALUATION OF SANITATION SERVICES

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PUBLIC HEALTH is a dynamic science, flexible to the demands and needs of a changing community. It is well known that, with the constant shifting of the population, with the high birth rate, the most rapidly growing population segment under five years of age and the second largest growing segment over 65 years of age, that public health programs which may have been well designed yesterday can be out of date today and far inferior tomorrow. For these reasons it is paramount that public health administrators give consideration to the constant evaluation of the effectiveness of their endeavors.

Let us begin by defining what is meant by evaluation.[1] Evaluation from the very derivation of the word means finding the value thereof. In other words it is a measurement. Measurements may be quantitative, qualitative, or a combination of the two. Measurements must be in some common denominator readily understood by everyone concerned. Thus we can count objects; we can measure the lapse of time; we can separate certain items from others; we can measure distance, weight, dimensions, light intensity, or any other objective value. In evaluation it is important to understand what is being measured. Are we measuring effort or are we measuring results? Thus at the very beginning we must determine what we mean when we say evaluation of programs in environmental health. Are we measuring the effectiveness of the effort which we put into the program or are we merely counting the number of times a certain service is performed.

We may also attempt to determine the quality of a program. Is the program "good," "fair," or "poor"? Here we have comparative terms which may be based on objective measurements, on subjective concepts or opinion, or a combination of the two. Often informed opinion of experts or levels of existing and desirable practices may be utilized as the best available indexes for comparison.

Another series of questions which must be answered have to do with specifying the objectives of a program. Have these objectives been defined in actual accomplishment? Can they be measured in readily accepted terms? Has the objective then been defined in reasonable and attainable terms, which are possible of measurement that can be interpreted and compared and within a given span of time or between several geographic areas?

Evaluation may be dependent upon such objective measurements as have been noted above. Sometimes they are based on the comparison of the experience of several health departments. In the "Health Practice Indices"[2] of the

American Public Health Association, last published in 1950, much of the comparison and relative standing of communities had to do with the interpretation of the level of practice. For example, the range of public health practices of 213 areas were drawn in 78 individual line charts. These data were obtained from the completed evaluation schedules[3] for 1948 and 1949. Many of these were then graded as follows. Those falling in the highest quartile were said to have good practice. Those falling in the upper middle quartile were said to have fair practice and those falling in the lowest two quartile were said to have poor practice. This, of course, is not the same kind of objective measurement that can be applied to certain other objects. The evaluation of milk might have to do with its butter fat content. A standard could be set at 3.5 per cent butter fat. This is a measurement which can be readily checked in the laboratory. On the other hand, where we come to the degree of completeness of pasteurization of a milk supply, some authorities may say a community is not practicing good public health unless 100 per cent of the milk is pasteurized. Others might say that when 95 per cent or more of the milk is pasteurized this is considered good practice. Still other experts might say a community has good practice if all but 20 per cent of the milk is pasteurized. Wherever the level is set, this level then becomes not an objective measurement but one which has been subjectively determined. In other words, informed opinion of experts has now entered the picture. In this example, evaluation is based first, on the presence of a specific kind of procedure which can be precisely defined, namely, pasteurization. Second, the degree to which it must be practiced, namely 100 per cent, 95 per cent, or 80 per cent, is a subjective index which is derived on the basis of experience plus informed opinion, the third element which has been used in the past in the development of evaluation indexes.

Thus in summary, evaluation measurement at its best may be based on precise measurements. Second, it may be based on experience and last it may be based on informed opinion of experts. Again, returning to our initial hypothesis that evaluation is the measurement of results rather than effort, we must be careful to determine what these results are. For example, in a milk sanitation program it is the commonly accepted standard to require two visits per producer farm per year. In many instances persons would evaluate the effectiveness of the milk sanitation program by whether this requirement has been attained, namely two visits per milk producer per year on the average. Thus, two visits per milk producer per year become in themselves an objective of the program. The thing which is measured is the number of visits rather than the effectiveness of the visits. One should in reality just define the objective of the program and measure it rather than an activity which was designed as an effort expended to attain it.

This type of error often creeps into evaluation procedures. Too often the number of visits, the number of restaurant inspections, the number of septic tanks approved, the number of milk farm inspections, or the like, is reported in an annual report of a department. Great pride is taken in the larger number, with the interpretation that many visits mean a more effective and efficient program. As a matter of fact, if the same results could be attained with half the number of visits, would this not be a more effective and efficient program? Would it not be more economical in that the results might be the same for half the same expenditure of funds?

Evaluation may measure not only effectiveness but also costs. What is the

cost of the program as a whole? What is the cost of a specific activity? For example, many states require premarital blood tests. How much does it cost to run a serological examination of the blood for syphilis? Are these the total costs? Do they include overhead, mailing, supplies, amortization of equipment, clerical time, and supervision? What of the cost to the individual and his fee to the physician? What is the total cost then of a serological test? But here again we are measuring effort and not results. What we want to know is: "What is the cost of finding a new case of syphilis that was previously unknown?" If it costs the health department a dollar to run the serological tests and the individual three dollars to have his blood taken, then the total cost is four dollars. If we have only 0.5 per cent positive bloods and only 50 per cent of these are unrecognized cases, then the cost of finding a new case is $4.00 (per test) x 200 (0.5 per cent positive) x 2 (50 per cent new cases) = $1,600.00. We may add that finding a new case is not enough—we want to follow up and make sure it is adequately treated and all contacts are investigated and, in turn, followed.

Evaluation may also be made in man hours of work. How much time of the laboratory staff and other health department workers is expended in finding a single previously unknown case through routine blood tests? If we assume that 10 minutes to one hour is required to run the test and do the clerical work connected with it, to find a new case would mean the equivalent of 400 hours of work. This means that one and a half to 10 weeks of 40 hours of manwork is required to find a single new case of syphilis from routine premarital tests under the assumptions presented. Evaluation may then go even further—is this one and a half to 10 weeks of work justified? And justified from what point of view? Our venereal disease epidemiologist may say—why of course it is. The laboratory worker who is pressured from all sides to do more may say no. The budget official would certainly question such an expenditure. The taxpayer might throw up his arms in horror.

Evaluation is, therefore, not entirely based on objective measurements. It must consider relative or subjective values; and it may relate to costs, manpower needs, and other comparisons with other activities of the health department, as well as other units of government.

What are we measuring when we measure laboratory tests, visits or farm inspections? We are merely determining whether the accepted tools of practice have been applied as it is judged they should be applied. We are not actually measuring or evaluating the objective of the program. As a matter of fact, the objective of the program has not yet been defined. What is the objective of a milk sanitation program then? Is it to have the milk pasteurized? Is it to have the milk delivered to the consumer in single service containers? Is the purpose of the milk sanitation program to limit the production of milk to a certain milk-production area? Is the purpose of the milk sanitation program to keep out harmful bacteria? If we carefully study all of these items, we find that these are merely tools, devices, and procedures which are used in the milk sanitation program and that they are not the ultimate objectives in themselves. The ultimate objective of a milk sanitation program is to assure the people an adequate, safe supply of nutritious, fresh milk. This, of course, is over simplification of our objective. We may need to define what is meant by an adequate, safe, nutritious, fresh milk supply. We might have to go further and indicate that this milk should be supplied at all times to the people within a given specific geographic area.

We would want to specify how much of the milk must be supplied. Should we set our goal as 100 per cent of the amount as may be demanded adequate by the population at any time? Over what period of time are we evaluating the program? Over the entire calendar year of 1960 or 1961? How will we determine whether this milk supply is adequate, safe, nutritious, and fresh? Will we measure effort or will we measure the result by determining whether it meets certain acceptable standards?

It is not the purpose of this presentation to outline a program for evaluating the milk sanitation program, or the restaurant sanitation program, or the program for the control and regulation of private sewage disposal systems, or for any other program in environmental health. The purpose of this presentation is to point out the necessity for proper design of program objectives in environmental health, so that it would be possible to define attainment of objectives precisely, to measure the degree of progress toward the attainment of these objectives, and to periodically evaluate the effectiveness of activities. Evaluation can then determine whether the program has attained the objectives for which it was intended, and to what extent, if any, it needs to be altered as conditions alter and change.

So often health departments fall into the trap of routinizing certain procedures. Thus it may be possible that a health department continues to make routine inspection of milk producing farms or restaurants at six-month intervals regardless of whether or not such a procedure is producing any results. It would appear that in the initiation of a program of milk or restaurant sanitation it may be necessary to make much more frequent visits than twice a year. Under another set of circumstances after a period of enforcements has been in effect for several years and after educational programs have been carried out in certain areas it may be completely unnecessary to make semiannual inspections. Between the two extremes of no inspections and repeated inspections at very frequent intervals, there may be every type of necessity for inspection. Would it not be better to periodically check the effectiveness of routine inspections and determine whether in reality they are necessary or are we falling into a routine of making inspections regardless of whether they are accomplishing a useful purpose.

There are many similar procedures which have become routinized and there is some virtue in the establishment of a routine. For those of us who wish to be leaders in public health and who have the job of adjusting public health programs to the changing needs of the population, the establishment of a routine may hinder progress. Thus, all departments have a responsibility of carefully designing programs and building into the design not only the definition of objectives which can be measured and attained within a reasonable time, but also building into such programs periodic evaluation procedures which are needed to determine the effectiveness of activities within the program. The need for evaluating activities and programs becomes more acute as the competition for the tax dollar increases. The health officer and his staff are asked to justify the expenditure of public funds for certain routine procedures which have been carried on for years. Merely because the director of the programs some twenty years ago started a certain routine procedure and it was found to be good and effective at that time does not mean that it must be continued at this time or in the future. Procedures, policies, records, and standards all need to be reviewed from time to time. Objectives of programs must be critically analyzed to determine their present and future applicability. Perhaps an objective that

had been set up ten years ago may have already been reached and bypassed only to have certain procedures designed to attain the objective still continued.

The field of environmental health is far from static as many would have us believe. The rapidly changing environment requires a flexible program. Many of these changes are due to the action of man. The concentration in densely populated areas, the advent of new industrial processes, and the complexity of modern suburban living are bringing new inbalance to the environment. The pollution of the atmosphere, of the rivers, streams and the soil itself, and the growing hazard of chemical and radioactive pollutants increases the problem several fold. Environmental health, therefore, becomes an increasingly complex picture in which we need to develop new tools for measuring the effectiveness of activities and programs. Even for many of the old activities it would be well to develop, through adequate research studies, the measurement of effectiveness of certain procedures. Is, for example, a restaurant sanitation program which requires two inspections a year really accomplishing its purpose? What is the purpose of a restaurant sanitation program? Is it impervious walls and ceilings or a certain prescribed method of washing eating utensils or placing food behind protective glass screening, or is it the provision of safe food and, if so, how do we define precisely this provision of safe food? What do we use to measure the success of our program? Will we permit old standards to prohibit trial of new programs in the future? Is it reasonable to insist on the application of an old ordinance that requires two or three compartment sinks with running water of 180° F and a chlorine rinse if current research confirms that new technics permit more adequate sanitation of glasses with cold water and iodoform in a newly designed apparatus? Will we maintain an open mind and permit the field testing and application of new methods and new technics? Progress in environmental health programs can be attained as we are ready to question accepted practices, investigate new approaches, test new ideas, and set new objectives.

If we were to accept the provision of safe food as the ultimate objective of a restaurant sanitation program, some health departments could at once proclaim success as has happened in our experience by simply stating, "Well, we have no reported food-borne outbreaks. Therefore, our restaurant sanitation program must be adequate." Or as the Chinese physician replied when I questioned him, "Do you have much mental illness in China?" To which he replied, "No, we do not. It is a very unimportant problem." I again questioned, "Well, how do you know that mental disease is no problem?" Our Chinese colleague replied, "Well, we have no mental hospitals in China." Nonrecognition of or ignoring the existence or possible existence of a problem does not mean that it can be forgotten. Thus unless objective measurements can be made of the actual safety of food served in restaurants, the mere absence of reported outbreaks cannot bring the observer to the conclusion that the food is actually safe. This is negative evidence and negative evidence cannot prove a point. Tools must be developed, therefore, which can actually assure the evaluator that the food is safe.

How are tools of evaluation developed? These can only be developed through research technics applied by competent persons in well designed studies to carefully selected samples. Such research can be conducted in cooperation with persons who are capable of adequately designing the experiment and the necessary controls. Thus the sanitarian or sanitary engineer, in fact the health department personnel, would do well to

turn to schools of public health and other agencies where there is the necessary statistical, epidemiological, administrative, and research competence to assist in the proper design of experiments, the interpretation and analysis of data, and the application of the results to the possible evaluation of other programs. The American Public Health Association, through its committees and Sections, has a responsibility for the development of standards and health practice indexes. The Technical Development Board of the American Public Health Association,[4] presented to the Council a report on "Procedures for the Development of Standards." The Section on Engineering and Sanitation, the Program Committee on Environmental Sanitation, and all affiliated groups have a responsibility in the development and revision of standards in environmental health. The application of these standards to specific programs is evaluation. But to inventory or list activities is to survey a program without adequate measurement of the attainment of objectives.

There is a place for field studies or surveys. These have an important function—to inventory facilities as well as the needs of a community. The "Guide to Community Health Services"[5] has been designed to obtain this objective and to obtain citizen interest in improving programs. This guide was designed to be used in three phases: first, the study group is urged to become familiar with basic needs and suggested standards of practice to meet these needs; second, it is urged to measure local needs and inventory adequacy of facilities to meet these; and third, to plan activities and programs designed to bring about indicated changes. Many state health departments[6] have utilized methods of surveying or evaluating local health activities. Some of these are based on modifications of the APHA Evaluation Schedule or the "Guide to a Community Health Study" as modified to meet local needs or objectives. Others have been based on the activity reports formerly used by the Public Health Service. Too often many of these required reports have not been properly designed to measure and compare progress. Perhaps, at this point it would be well to make a plea: a required activity report from a local health department should be designed so as:

1. To measure progress within the local health department on its attainment of specified objectives.
2. To compare like communities and establish indexes of acceptable practice.
3. To enable the state to analyze the data, prepare adequate reports, and make recommendations to the local health department which, in turn, could be required to report its plan for action on these recommendations and later to indicate the degree to which these new objectives have been attained.

Summary

Evaluation in environmental health means as it does in all public health programs the measurement in terms that can be readily understood and compared of the attainment of specified objectives in a specified time and place. It means that the same measurements might be applied to the same program from time to time to measure progress against a given baseline. It means that measurements may be applied to other programs for the purposes of comparing the effectiveness of the programs. Evaluation means the measurement of results that may be attained by one of several methods where each of the methods is subject to critical measurement. By evaluation we mean the application of objective measurements in terms readily accepted and when these are not available by the use of experiential data and finally by the utilization of informed opinion of experts. In the latter two categories we are, of course, using subjective materials in carrying out evaluation.

To effectively measure existing activities and to measure new procedures, it is necessary to develop new evaluation tools and new standards through research on a cooperative basis between health departments and teaching institutions. It is necessary that these be carried out with adequate controls on a spot survey basis, that there be careful analysis and interpretation of the data to determine its applicability as an evaluation tool or index. Finally as accepted standards and evaluation tools can be accumulated, there needs to be developed a new evaluation schedule which could be utilized by health departments to measure the effectiveness of their programs from time to time and to compare their effectiveness with other similar health departments. Only in this way can we have the development of a new set of health practice indexes which will have more objectiveness than those which were formerly used. Because of the rapidly changing pace of public health programs, especially as they apply to environmental health, there is an urgent need for the development of accepted standards, evaluation tools, their application, their comparison, and the development of health practice indexes in the field of environmental health.

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Yellow Fever Case in Trinidad

The Foreign Quarantine Service of the Public Health Service uses the first confirmed case of yellow fever in Trinidad, since 1954, to recommend yellow fever vaccination for all persons visiting Trinidad. A valid Yellow Fever Vaccination Certificate within six days of leaving the island is required for all persons arriving in the United States from Trinidad.

Preservation of foods by irradiation is a topic of keen interest today. The problems of this radically new process are reviewed in the following paper from the point of view of the Armed Forces, and a description is given of the program which has been developed to deal with them.

PRESERVATION OF FOODS BY IRRADIATION

Harry E. Goresline, Ph.D., F.A.P.H.A., and Norman W. Desrosier, Ph.D.

Military Needs and Food Irradiation

THE FEEDING of members of the Armed Forces is an important factor in effective operations. Not only must the food be nutritious but it must have an appeal that gives satisfaction to the consumer. The American soldier likes food variety; he likes a satisfying meal, and he likes to have it where he is and not at some inaccessible point. The concepts of military operations are changing rapidly, from concepts of static or slow-moving operations to those of extreme mobility, from concepts of concentrations in strength to those of dispersion with even greater strength. With these new concepts has arisen the necessity for versatile and effective new means of supply, one of the important segments being that of food supply.

To meet such a challenge it has become necessary to embark on a program of investigation to determine the best means of supplying food to operational troops, on land, in the air, or under the sea. To meet the need of the modern military forces the food must be nutritious, light in weight, occupy a minimum of space, be extremely stable without refrigeration, and be palatable to the soldier over a considerable period of time. Studies have led to improvement of existing ration items, the development of new types of items, and investigations into entirely new types of products. From these studies have come liquid foods and semisolid foods for the feeding of airmen at high altitudes, dehydrated precooked foods that require only the addition of water to prepare a complete meal for ground troops, and ration-dense foods for seamen. One of the boldest approaches contributing to solving food problems in this area is the use of ionizing radiation to preserve food items. This paper is concerned with this particular approach to the provision of ration items for the Armed Forces.

Successful preservation by irradiation would offer several advantages not apparent in other types of preservation. For example, preservation by ionizing radiation is a "cold process" and, therefore, can be used on foods sensitive to thermal processing. Also, such items as roast pork, fried chicken, bacon, or sandwich components can be preserved in their natural states without much change in flavor or loss of texture such as would be characteristic of thermal processing. While the density or weight of this type of food item can be altered very little other advantages indicate that this method of preservation would prove advantageous in certain areas.

Development of the Research Program

When the initial work was started on the use of ionizing radiation for food

preservation very little was known of the public health aspects, the effect on nutritive substances, or the means of reducing the method to practicable application to food processing. A great deal of basic scientific information was necessary before several of the questions could be answered, and since it was not practical to undertake all the investigations necessary to such a program within the laboratories of the Armed Forces a large contract research program was instituted under the guidance of the Quartermaster Research and Engineering Command, Office of the Quartermaster General.

The basic areas where information was required were delineated and research in these areas was started, under contract, in many university laboratories, industry laboratories, and in private research organizations. Such work included studies on the chemical changes in foods during irradiation, the sensitivity of various microorganisms to irradiation, changes in flavor and texture, and the very important area of effect of irradiation on the wholesomeness of treated foods. The latter area became a "must" in the program since the existence of any acute or residual toxicity or the adverse effects from eating such foods must be determined before approval would be provided by the Surgeon General for consumption of such food by troops.

The entire program was designed to cover a wide variety of research areas and to be comprehensive enough to obtain answers necessary to put such a process into operation should it prove to be advantageous to the system of Armed Forces food supply.

The food irradiation research program involves extensive work in several areas. During the year, July 1, 1957, to June 30, 1958, there were about 45 contracts involving the transfer of funds, 40 cooperative contracts with industry and 30 contracts in the area of wholesomeness under the supervision of the Office of the Surgeon General.

The Quartermaster Food and Container Institute for the Armed Forces is charged with the job of getting the research done and bringing together the threads of results of such research into a fabric of facts and information. While this tapestry is far from completed it presently reflects many facts and accomplishments and indicates a pattern for certain future developments. These include the proving of the process under a commercial type of condition. It has been truly a cooperative effort involving several hundred workers in many scientific disciplines. Some of the research and the accomplishments will be reviewed here.

The Process

One of the major requirements of a preservation method is that it kill microorganisms which cause deterioration and spoilage. Studies on the use of ionizing radiation indicate that the killing dose to insure preservation against spoilage by various types of microorganisms is about 250,000 rads for molds and yeasts and three to four million rads for spore-forming spoilage bacteria, other than Clostridium botulinum. From a public health point of view assurance of the killing of Cl. botulinum is very important. In the case of radiated foods the sterilizing dose must be based upon the killing of this organism as investigations have shown that this spore-forming microorganism is the most difficult to kill. In thermal processing certain spoilage organisms may survive a treatment that kills all Cl. botulinum but, with irradiation treatment, the reverse is true. Research calculations indicate that the required dose of irradiation to insure safety is approximately 4.5 million rads in foods above pH 4.5. This has been set as the present standard treatment, but some of

the current research effort is directed at finding ways of lowering the dose required to sterilize.

The control of insect infestation, prevention of molding in acid products, sprout inhibition in vegetables and the extension of "shelf life" at cool storage temperatures can be accomplished at low doses of radiation and will be useful in meeting certain food supply problems. Under conditions where refrigeration is available radiation treatment offers possibilities of marked extension of storage life.

In order to assure that a given radiation dose actually is received by the food considerable work has been done in the area of radiation dosimetry. To make a given treatment practicable, it is necessary not only to have control over the application of the radiation but also to measure accurately the energy absorbed. The research program has developed a system of dosimeters of considerable accuracy for use in food irradiation. Ceric sulfate dosimeters for doses above 200,000 rads and cobalt glass for doses below 500,000 rads have been selected as the operating standard for integrated delivered dose. These dosimeters are in turn standardized against the Fricke (ferrous sulfate) dosimeter on a specially designed calorimeter.

It also is desirable to monitor the radiation source continuously for instantaneous dose rates. This is to be accomplished by elaborate variations of an ionization chamber.

In addition, it is mandatory to know that each and every food package has, in fact, gone through the radiation equipment. For this purpose a rough go-no-go-type of dosimeter is used. Here a definite color change in a dye indicates that the parcel has been irradiated. This information, coupled with that obtained by use of the radiation monitor and the precision dosimeter, leaves no room for error in determining that a given food parcel has received the radiation dose which was intended for it.

The amount of radiation necessary to inactivate the natural enzymes of plant and animal tissue exceeds that necessary to kill microorganisms. Since adverse flavor and texture changes increase as the radiation dose is raised it is advantageous to use the lowest dose possible to prevent spoilage. Enzymes can be inactivated by heating to a much lower temperature than that necessary to kill bacteria. Therefore, the most practicable approach to the problem is to preheat the food product to a point where the enzymes are inactivated and then to irradiate to the level necessary to kill the microorganisms. This is proving of value in foods that are sensitive to severe thermal processing. Such heating can be in water, live steam, or dry heat such as in an oven. Sterile products that undergo rapid deterioration at room temperature due to enzyme activity will remain in excellent condition if preheated prior to irradiation.

Two noticeable defects caused by irradiation in certain foods are the development of changed or off-flavor and a softening of the texture. These are aggravated by higher doses of radiation. The flavor defect is quite noticeable in beef and since beef is a very important item in the diet of the soldier, major effort is being exerted to solve problems encountered with this item. Pretreatment methods, elimination of oxygen from the package and absorption of certain odors within the package are showing considerable improvement in some irradiated products. It has also been demonstrated that the removal of certain volatile compounds formed during irradiation by vacuum distillation markedly improves the flavor quality of irradiated milk.[1]

Packaging for Irradiated Foods

Protection against deterioration and spoilage and reduction in weight and

over-all dimensions of packaged items are objectives of the Armed Forces supply system. Considerable saving in weight and reduction in cube could be attained if flexible film packaging could be substituted for the metal container used at present. Considerable work has gone into the investigations of flexible film packages for irradiated foods. Many problems have been encountered such as the evolution of odors from the film during irradiation, difficulty in obtaining satisfactory seals, stress cracking and stability of the films. It is necessary to have a package that cannot be penetrated by insects or by bacteria, has extremely low moisture and oxygen transfer rates, and will withstand a reasonable amount of rough handling. At the present time the metal container is the only satisfactory container for irradiated foods, although rapid strides are being made in overcoming some of the difficulties encountered in the use of flexible films.

Acceptability Testing

The acceptability of food items plays an important part in the morale of a soldier and in maintaining good nutrition. The men will not eat food of low acceptability and, in consequence may lose effectiveness because of poor nutrition. Radiation-stabilized foods are subjected to palatability testing at each stage in the development of an item. When a product of potential military value has been developed it becomes necessary to present it to larger taste panels and to troops representative of those that may eventually subsist on such an item. To accomplish this extensive testing, plans of procedure are drawn up and the food items fed to volunteer troops by the Field Evaluation Agency, a division of the Quartermaster Research and Engineering Command, at Ft. Lee, Virginia. The radiation-stabilized product is fed as a part of a full meal. The men do not know which is the test item. They are asked to evaluate all of the items on the menu according to a nine-point scale designed to represent acceptance from "like extremely," to "dislike extremely." To date two radiation-stabilized meat items stored at room temperature for more than six months have been tested by such a troop panel with very encouraging results. No significant differences were found between the acceptability of such radiation-stabilized products and the same items prepared from fresh material. Other radiation-stabilized foods will be troop-tested as rapidly as they can be prepared and volunteer troops are available.

Assurance of Wholesomeness

The Research and Development Division, Office of the Surgeon General, has been supervising a very energetic and comprehensive program to establish the wholesomeness of radiation-stabilized foods. The work is being carried out at the U. S. Army Medical Research and Nutrition Laboratory and through the efforts of some 30 contractors. This is probably the most extensive investigation of its kind ever undertaken. The objectives of these wholesomeness studies are to demonstrate that foods preserved by ionizing radiation for human consumption (1) cause no untoward physiological response, (2) are nutritionally adequate to maintain normal physiological functions incident to all life processes, (3) are not carcinogenic, and (4) do not cause maladjustments in enzyme systems which may represent incipient disease. To accomplish this, radiation-stabilized foods are subjected to both short-term and long-term feeding studies using several species of animals (dog, rat, monkey, and chicken). When these studies have been completed the program is designed to proceed to longer term human-feeding studies using

volunteers. It is planned to have these test subjects receive up to 95 per cent of their calories in the form of radiation-stabilized food over a definite test period.

This wholesomeness program will involve complete tests on approximately 21 foods and will be completed in about two years.

It can be seen that every effort is being made to cover adequately every facet having a bearing upon the health of the consumer. Studies to date have not revealed any untoward results in the foods under test.[2] A very careful analysis will be made of all data obtained before any clearance can be given to permit the inclusion of radiation-stabilized food in the normal diet of the soldier.

Application to Production

To be successful any method of food preservation must show potentials for production by industry. The radiation of foods is a new process and its practicability must be demonstrated not only to produce palatable, wholesome and nutritious food but also that commercial production is practicable and economical. To that end there is presently being planned a U. S. Army Ionizing Radiation Center. This planning is being done by the Radiation Planning Agency of the Quartermaster Research and Engineering Command. This food irradiation facility will be constructed at the Sharpe General Depot near Stockton, Calif., and is scheduled to start operation during the latter part of 1960. The plant will be of such capacity that practicable demonstration can be carried out in putting into production the treatments and systems evolved from the research and development programs described above and in obtaining economic data of value in estimating processing costs. It will be necessary to design, build, and demonstrate equipment and systems never before used in the food industry. Such demonstrations are necessary before the Armed Forces can profit from the advantages offered by the food irradiation process.

Summary

A radically new process for the preservation of foods is under investigation by the Armed Forces to determine its potentials in solving certain problems of food supply to troops. The Irradiation Preservation of Foods Program is a cooperative endeavor involving many workers in several fields of science. Studies are under way to prove the practicability of the process, the development of irradiated ration items of value to the military, and the proof of wholesomeness and public health significance of foods treated by this method. The objective is to produce wholesome, nutritious, and palatable types of foods that will keep without refrigeration or if radio-pasteurized will have a longer storage life under refrigeration, and to produce types of food not now available to troops.

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This paper presents the viewpoint of industry on the preservation of foods by irradiation.

PRESERVATION OF FOODS BY IRRADIATION

VIEWPOINT OF INDUSTRY

L. E. Clifcorn, Ph.D.

IN THE FOOD INDUSTRY a new process must enable the production of a new or improved food product that meets consumer needs or desires at a reasonable cost. By careful scrutiny of product quality and cost, the American housewife will determine by the number of repeat purchases of the food product whether the new process is a success. The reputation and success of the food industry has been built on the principle that foods must look good and taste good and that a uniform product quality must be maintained.

Besides rendering a service to our consuming public, food processing companies must make a profit. A thorough evaluation must be made of what foods may be benefited by radiation and whether these benefits are sufficient to carry—at least in the early stages—(a) the higher capital costs for equipment, (b) the higher operating costs, and (c) costs for consumer education to foods having new sensory characteristics and possibly new cooking requirements. These evaluations must follow the results obtained at the research level.

Food processors, of course, are concerned over any new technology which may affect their capital investments. On several occasions the questions have been asked by individuals with interests in the welfare of their segment of the food industry: "Is radiation treatment of foods commercially practical? Will it replace canning or freezing? What will its effect be on food containers?"

At the Fifth Annual Contractors' Meeting of the U. S. Army Quartermaster Corps Radiation Preservation of Foods Project early this year, Victor Conquest, vice-president of the Research Division of Armour and Company, Chicago, and also vice-president of Irradiated Products, Inc., production planning contractor for the U. S. AIRC, said the food industry is divided in its beliefs as to what will be the ultimate effects of radiation treatment of foods.[1]

> "Some have said they see no need for such a development. These, I think, are becoming fewer as they consider the prospective gains. Some are neutral and are waiting and observing the progress of developments before having an opinion. I probably represent the third group, and it seems there are many of us. We believe irradiation has its valuable uses. We must learn its technology, with what products and under what conditions it is best used, and in what combinations with other preservation methods the best product and economic results can be attained."

For further perspective, let us briefly scan some of the important technological areas of food radiation research.

Flavor—The off-flavor, off-odor problem is the No. 1 problem that must be overcome before the food industry can

make wide application of this process.[2] Foods vary greatly in their sensitivity to off-flavor development during irradiation. The degree of off-flavor development is directly proportional to the radiation dose and can be controlled in some foods by irradiation in the frozen state, the use of an inert gas, and other technics.[3] For pasteurization treatments (200,000 rad or less) the problem of off-flavor is insignificant or less severe than for sterilization dosages up to 4.5 megarad required to destroy Cl. botulinum. Many meat and fruit and vegetable products are most satisfactorily surface pasteurized with appealing extension of storage life.[1,4] With regard to sterilized foods, considerable encouragement is obtained from the Ft. Lee acceptability tests on two meat products which were sterilized at high radiation dosages and stored for more than six months before testing.[5] Similar favorable results are expected for some of the other products to be included in such tests in the near future.

Although the public may be educated to a different but highly acceptable flavor in an improved food product, it is important that uniform flavor characteristics be maintained. Above all, any discernible obnoxious flavor from irradiation would result in poor market acceptability.

Wholesomeness and Nutrition — No residual radiation remains in foods even after they are treated with 25 Mev electrons.[6] Forty-two radiation treated foods which had passed animal testing procedures were further evaluated on human subjects in the program of the Army Medical Nutrition Laboratory.[1] No harmful effects were observed.

Before foods treated to any extent with radiations are offered to the public, Food and Drug Administration approval of the treatment must be obtained. It is the general feeling that such approval will be forthcoming in the next few years.

Some sacrifices in nutrients are made in all types of food preparation, processing, and preservation. The same is true for radiation treated foods. Reliable investigators in this field have made the statement that the retention of nutrients in radiation treated foods is comparable to that in thermally processed foods.[7,8]

Economics—With regard to sources of radiation for food processing, a recent article by Dr. L. G. Cook of the General Electric Company has projected costs of isotope and machine sources of radiation for possible industrial use. Machine sources are now available from $10,000 to $40,000 per kw. Costs of $5,000 to $6,000 may be projected for the near future if machines of 10-100 kw power are needed. Isotope sources were estimated to cost $60,000 per kw for Co-60 and $240,000 per kw for Cs-137. The machine sources provide cathode rays with an approximate 50 per cent energy utilization factor while the isotope sources provide gamma radiation with a much lower energy utilization factor.

If the machine source is used as a basis for cost analysis and it is assumed that we will irradiate a food at 2 megarad with a 50 per cent energy utilization factor, we find we can treat 1970 lb of food per hour with a 10 kw machine costing from $100,000 to $400,000. A 100 kw machine costing a million dollars will treat 19,700 lb of food per hour. The depreciation (10 year) operating and maintenance costs are estimated to be around two cents per pound on an eight-hour single-shift basis. For sterilization at four megarad, the cost is doubled to approximately four cents per pound. For low dosage treatment at 100,000 rad, the cost drops to approximately one-tenth of a cent per pound.

For comparison, a single-line pea cannery capable of canning from 12,000 to 15,000 lb per hour or a ham canning

operation at 10,000 lb per day presently steam sterilizes the canned products at costs of 0.1 cent per pound or less.[10]

In the food industry, in particular, profit margins are small. Costs consequently are scrutinized very closely. Only the more expensive food commodities can justify the capital investment of a radiation source for sterilization purposes. Meat, chicken, oysters, and fish may be examples if the product has good consumer quality and some definite advantage over that being produced by conventional processing methods.

As was apparent from our review of the off-flavor problem, foods treated with low radiation dosages are commercially the most attractive.

Consumer Acceptance—If the radiation process is successful, the matter of the degree of cooking required by the consumer is one that must be considered by the food processor. It may be desirable to cook some foods partially or completely prior to irradiation for best table acceptance. Specific to this process is the opportunity for a wide range of precooking of preserved foods. The heat treatment for precooking some foods prior to irradiation may or may not be the same as the amount of heat required for enzyme destruction. Although ionizing radiations are effective in destroying bacteria, about five to thirty times the dosage is required to destroy enzymes. Such radiation dosages denaturize foods and render them inedible. Therefore, a mild heat treatment to destroy enzymes, followed by irradiation, appears to be a preferred treatment for many foods.

Packaging—For pasteurized or surface treated foods with low radiation doses for extended storage life, plastic film packaging will no doubt be predominate.

For radiation sterilized foods flexible packages have many problems yet to be solved to meet the requirements. In most instances metal containers will be used. The absorption of a very small fraction of the radiation energy by metal containers during the irradiation of the container and contents is no problem. In comparison to thermal processing, since the containers no longer have to withstand internal pressure, metal container specifications can be changed considerably.

Aluminum containers, dependent upon cost, are a definite possibility. Glass containers darken when subjected to ionizing radiations.

In consideration of production costs and advantages offered, it is apparent that the area of low dosage treatment of foods offers the greatest commercial potential. Pasteurization treatments of prepackaged meats at levels up to 60,000 rad have produced no significant off-flavors and have extended refrigerator shelf life from five to twenty times.[4] Similarly, many fruits and berries and some vegetables have shown extended storage life by flexible packaging and low dosage treatment. Other low dosage irradiation applications of commercial interest are: (1) a means of inhibition of potato sprouting, (2) a method of producing Salmonella-free dried and frozen eggs, (3) a method for destruction of insects and larvae, and (4) a method of destroying trichinae in pork. As is the case with radiation sterilization, most of these low dosage applications are in competition with other methods for doing the same thing. Here again, the factors—cost and specific advantage—have to be carefully evaluated. Generally speaking, there seem to be no insurmountable technical obstacles to low dosage radiation applications to foods.

It is of interest to note that at the last Geneva Conference on Peaceful Uses of Atomic Energy it was reported that the Russians are the first to permit the sale of an irradiated food.[4] In their paper they made the following statement: "On

the basis of the tests conducted, the USSR Chief of Public Health Inspection has authorized the use of potatoes irradiated with a 100,000 rad dose, for food." At the same meeting the British reported that their most promising and compelling use for food irradiation appears to be the destruction of Salmonella in frozen eggs. In recent years several deaths traced to Salmonella from this source have been reported.

From present accomplishments, it appears that the treatment of foods by radiations will express itself first in the form of combination treatments, complimenting rather than replacing the present conventional processes such as canning, refrigeration, dehydration, and antibiotics.

Above all, in the evaluation of the over-all potential of radiation in the food industry one must consider very carefully the advantages to be offered by this method of destroying bacteria over that presently used. The radiation treated product must be better in quality and/or offer a wider latitude of resistance to storage and handling abuse in distribution or in the home to justify a large capital investment and higher processing costs. More sales, less product loss in distribution, or a product improvement justifying a higher selling price must be assured before the radiation treatment of foods will be undertaken by any reputable profit seeking food manufacturer.

Above all, we must be patient. About 150 years ago Nicholas Appert discovered the art of canning, but it was not until 50 years later that Louis Pasteur brought understanding of the process through his bacteriological discoveries. In the last 50 years a tremendous additional wealth of scientific know-how has been added to the art of canning to make it what it is today. The first mechanical refrigerator was developed about 1850. The commercial utilization of freezing for food preservation on a large scale did not gain momentum until approximately 1930. The art of destroying bacteria in a food by an invisible beam of radiant energy is still very young. It is the most promising new principle of food sterilization since Appert's discovery of canning. There are strong indications that valuable specific applications will be forthcoming.

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What are the long-range effects on man of low-level, environmental radiation? This study raises the question on the basis of an epidemiological study in New York State. The investigators undertook to see whether there was any correlation between increased rates of malformations and residence in areas containing materials with relatively high levels of radioactivity.

AN EPIDEMIOLOGICAL STUDY OF CONGENITAL MALFORMATIONS IN NEW YORK STATE*

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CONGENITAL MALFORMATION rates, based on information entered on birth and death certificates, are higher in certain areas of New York State than in others. Available geological data indicate a correlation between areas with high malformation rates and geographical locations containing natural materials with relatively high concentrations of radioactive elements.

The initial clue to this association was uncovered by the senior author in 1954 after his attention was directed to an "unusually large number of cleft palate patients" who were residents of a northern New York county.† Information obtained from the Office of Vital Statistics of the New York State Department of Health showed relatively high reported rates for all congenital malformations in townships within one portion of this county. Data from the Atomic Energy Commission pertaining to a reconnaissance of radioactive rocks of the Hudson Valley and Adirondack Mountains[1] revealed that the townships with a high reported malformation rate were located in an area with igneous bedrock outcrops having relatively high levels of radioactivity and an average range of equivalent uranium content between 0.003 and 0.004 per cent.

A review of the reported congenital malformation rates for all townships within Upstate New York‡ indicated that additional areas with elevated rates were located primarily in the Adirondack Mountains, Hudson Highlands, and portions of the Allegheny Plateau section of southern New York. These areas also contain igneous or black shale bedrock having relatively high radioactivity levels[2-5] or glacial deposits of these materials associated with advances and retreats of the ice sheets.

As a result of these leads, an epidemiological study was initiated in Upstate New York with the following objectives:

* The association of elevated malformation rates in man with residence in areas containing natural materials with relatively high concentrations of radioactive elements.

† Observation by Louis M. DiCarlo, Ed.D., director, Syracuse University Speech and Hearing Center.

‡ The term Upstate New York is synonomous with New York State, exclusive of New York City, and will be used in the material which follows.

1. Determination of the incidence of congenital malformations reported on birth and death certificates by county, city, township, and village.
2. Determination of the type, amount, and distribution of natural materials with relatively high concentrations of the radioactive elements.
3. Determination of the association, if any, between the incidence of congenital malformations and the distribution of such materials.
4. Evaluation of the roles which known teratogenics, including radiation, may have had in producing congenital malformations within relatively high and low malformation rate areas.

Incidence of Congenital Malformations

Number and Types of Malformations Reported on Birth and Death Certificates

Birth and death certificate information was used exclusively for the purpose of compiling congenital malformation data. Information from the Medical Rehabilitation (physically handicapped children) Program in New York State was not utilized because of the high degree of selection of cases under the program. Stillbirth data were also excluded because of the unreliable nature of the reported causes of stillbirth.

The birth certificate used in Upstate New York contains on the reverse side a confidential medical supplement. Attending physicians are asked to answer a number of questions, including "Congenital malformation of infant: No__, Yes__. If yes, describe." This question is answered in the negative or with a specified anomaly on 90 per cent of the certificates. Recorded anomalies are subsequently classified by the Office of Vital Statistics as to congenital malformation type according to the "International Statistical Classification of Diseases, Injuries, and Causes of Death." Nonphysician deliveries in New York State are for all practical purposes nonexistent.

For the years 1948-1955 all certificates of death for children under five years of age, stated to have been born in Upstate New York, were also available and were matched to their corresponding birth certificates. Malformations which were reported only on the death certificate were added to those reported on the birth certificates.

Table 1 shows, for each of the years 1948-1955, the number of live births to residents of Upstate New York; the number of these births with malformations reported on the birth certificates; and the number of children with malformations unrecorded at birth but subsequently reported by death certificate.

For the entire period there were 13,248 births with malformations reported by birth certificate, and 3,121 by death certificate only—a total of 16,369 individuals, representing an average annual incidence of 13.2 congenital malformations per 1,000 live births.

Table 2 shows the total number of cases for the period of 1948-1955 by general malformation categories according to whether reported on the birth certificate or by death certificate only. When two or more malformations appeared on the birth certificate, the case was allocated to the more serious category. When a child with a malformation reported on its birth certificate died from another malformation, it was classified to the malformation reported as the cause of death.

Malformation Rates for Cities, Villages, and Towns

Births recorded Upstate are allocated to the usual place of residence of the mother. The 1948-1955 births and recorded malformations were tabulated by residence for each city and village over 2,500 population and for each township, exclusive of any villages over 2,500 located within the township. Rates per 1,000 live births were then computed for each of the areas.

Table 1—Births recorded in New York State, exclusive of New York City, to residents of that area and the incidence of congenital malformations among them, as reported on the birth certificates or on the certificates of death under five years of age, 1948-1955

Year	Live Births	No. with Malformations Reported by Birth Certificate	No. with Malformations Reported by Death Certificate Only: Under 1 Year	No. with Malformations Reported by Death Certificate Only: 1–4 Years	No. with Malformations Reported by Birth or Death Certificate	Rate per 1,000 Live Births: Reported on Birth Certificate	Rate per 1,000 Live Births: Reported on Birth or Death Certificate
1948	141,098	1,481	401	74	1,956	10.5	13.9
1949	142,044	1,537	331	49	1,917	10.8	13.5
1950	143,163	1,475	325	40	1,840	10.3	12.9
1951	151,773	1,678	374	51	2,103	11.1	13.9
1952	159,760	1,760	349	42	2,151	11.0	13.5
1953	161,154	1,751	355	36	2,152	10.9	13.3
1954	168,822	1,796	330	15	2,141	10.6	12.7
1955	174,930	1,770	349	—	2,119	10.1	12.1
1948–1955	1,242,744	13,248	2,814	307	16,369	10.7	13.2

Table 2—Malformations reported on the birth certificates or on the certificates of death under five years of age, according to type of malformation: New York State, exclusive of New York City, 1948-1955

Type of Malformation	Total	Malformation Reported on Birth Certificate: Not Known to Have Died	Malformation Reported on Birth Certificate: Died from: Malformation*	Malformation Reported on Birth Certificate: Died from: Other Causes	Malformation Reported on Death Certificate Only
All malformations	16,369	9,465	2,725	1,058	3,121
Central nervous system	2,595	578	1,459	142	416
Monstrosity	476	31	356	33	56
Spina bifida and meningocele	1,223	379	703	61	80
Hydrocephalus	631	66	343	26	196
Other	265	102	57	22	84
Circulatory system	2,715	194	617	80	1,824
Hare lip, cleft palate	1,414	1,267	41	102	4
Digestive system	1,072	195	237	53	587
Genitourinary system	1,270	1,037	102	41	90
Skeletal system	2,276	2,131	5	136	4
Bones and joints	1,461	1,276	41	123	21
Mongolism	392	257	19	78	38
Other and unspecified malformations	3,174	2,530	204	303	137

* When cause of death was a malformation different from the malformation stated on birth certificate case was allocated to malformation given as cause of death.

Figure 1—Distribution of cities and towns with congenital malformation rates over 20/1,000 live births, 1948–1955

There is little state-wide difference in the incidence of malformations for urban and rural areas. The rates are 12.9 per 1,000 live births for cities over 10,000, 13.4 for incorporated communities 2,500-10,000, and 13.5 for rural areas. In all, 186 out of 942 townships have rates of 20.0, or more. These are shown on the map in Figure 1. While these are scattered throughout the state, seven counties have no township with a rate this high, and 12 counties have only one each. In many counties the high rates are in adjacent townships, forming a cluster. For example, in St. Lawrence County seven of the eight high rate townships are adjoined and are adjacent to the one high-rate township in Lewis County. Similar clusters are also located in the Adirondack portion of Essex, Franklin, Warren, and Saratoga Counties; in the Catskills; and in the counties of the Allegheny Plateau. All of the counties with no high-rate townships lie in the Erie-Niagara-Mohawk plain, in the Hudson Valley lowlands, and on Long Island.

Type, Amount, and Distribution of Natural Materials with Relatively High Concentrations of the Radioactive Elements

All rocks contain at least minute quantities of the radioactive elements. The most important of the naturally occurring radionuclides are C^{14}, K^{40}, Ra^{226}, Th^{232}, U^{238}, as well as the decay daughters of the last three nuclides.[6]

Rocks containing these materials may occur as bedrock or as less massive, fragmentary products of erosion. Large quantities of these smaller rock particles are associated with extensive morainal deposits of the glacial ice sheets.

Radionuclides from rocks, or their erosion products, may leach into ground waters, be utilized by plant life, or be disseminated into the atmosphere as gases or as particulate matter. The amounts of these materials in the environment are usually greater when associated with rocks with relatively high concentrations of the radioactive elements.

Table 3—Natural occurrence of radioactive elements

	Ra^{266} (10^{-12} gm/gm)	Th^{232} (10^{-6} gm/gm)	K^{40} (10^{-6} gm/gm)
Granite rock	1.6–4.7	8–33	3.5
Sedimentary rock	0.3–1.0	1–5	0.1–1.0

Bedrock

Most of the common rock types occur within the boundaries of New York State. These include igneous and metamorphic rocks, and the sedimentary shales, limestones and sandstones. The general distribution of these bedrock materials within New York has been extensively mapped by geological workers and is illustrated in Figure 2.[7]

Generally, more silicic igneous rocks, such as granite and syenite, have a higher concentration of radioactive elements than do less silicic igneous types, such as basalts or the sedimentary rocks. Among the sedimentary rocks, limestones and sandstones are relatively low in radioactivity, while shales are somewhat higher. Organic black shales have been found to be especially high.[4] Differences in the occurrence of radioactive elements in granite versus sedimentary rock types are in the magnitude of as much as five to one as illustrated in Table 3.[8]

The Atomic Energy Commission has published four reports dealing with reconnaisance of radioactive rocks in New York State.[1-3,5] Vickers also made a study of the radioactivity of various sedimentary rocks in central New York.[4] Additional unpublished studies of the organic black shales have been made by staff members of the New York State Geological Survey.

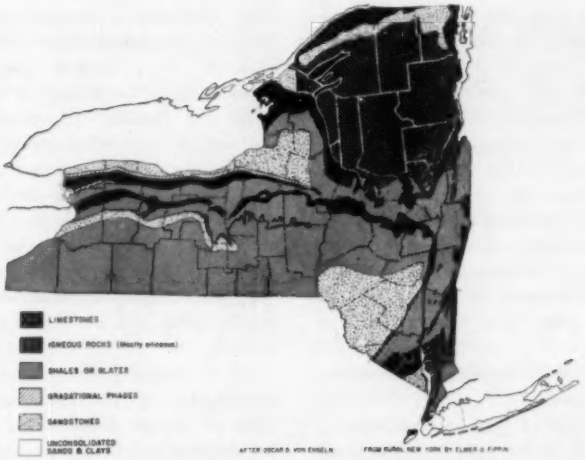

Figure 2—Underlying rock formations

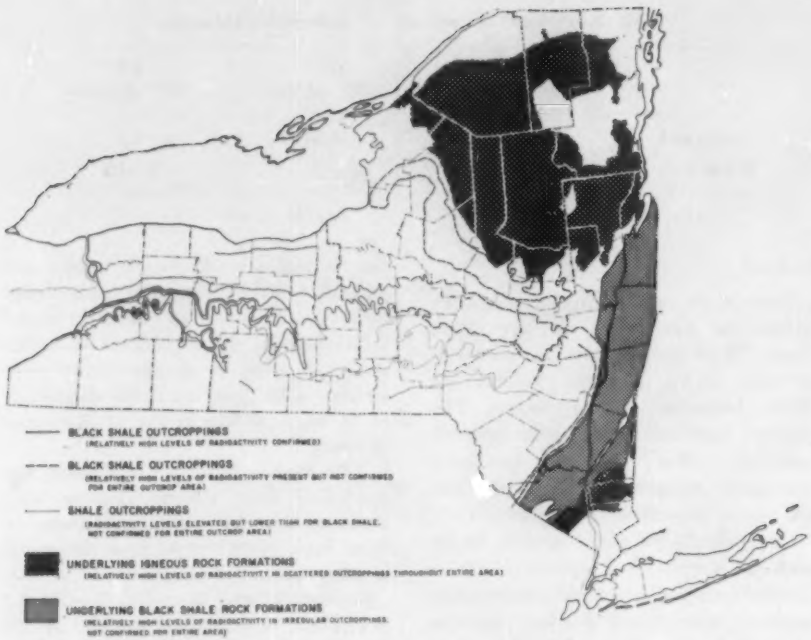
BLACK SHALE OUTCROPPINGS
(RELATIVELY HIGH LEVELS OF RADIOACTIVITY CONFIRMED)
BLACK SHALE OUTCROPPINGS
(RELATIVELY HIGH LEVELS OF RADIOACTIVITY PRESENT BUT NOT CONFIRMED FOR ENTIRE OUTCROP AREA)
SHALE OUTCROPPINGS
(RADIOACTIVITY LEVELS ELEVATED BUT LOWER THAN FOR BLACK SHALE, NOT CONFIRMED FOR ENTIRE OUTCROP AREA)
UNDERLYING IGNEOUS ROCK FORMATIONS
(RELATIVELY HIGH LEVELS OF RADIOACTIVITY IN SCATTERED OUTCROPPINGS THROUGHOUT ENTIRE AREA)
UNDERLYING BLACK SHALE ROCK FORMATIONS
(RELATIVELY HIGH LEVELS OF RADIOACTIVITY IN IRREGULAR OUTCROPPINGS, NOT CONFIRMED FOR ENTIRE AREA)

Figure 3—Rock outcroppings and areas with underlying rock having relatively high levels of radioactivity

The areas with the greatest concentrations of materials with unusually high radioactivity levels were found by Narten and McKeown[1] to occur in the northwestern and southeastern Adirondacks where there are numerous contacts between gneisses of the Grenville series and the granosyenite complex. The Hudson Highland gneisses were found by McKeown[3] to have an average percentage of equivalent uranium from 0.003 to 0.004 per cent which is higher than the 0.002 per cent that is considered to be normal.

A state-wide compilation of these data is illustrated in Figure 3. This includes mapping of surface outcrops of organic black shales containing at least 0.003 per cent equivalent uranium. Shale outcrops with radioactivity levels elevated but lower than that for black shale are also indicated. The underlying igneous rock formations of the Adirondack and Hudson Highland provinces are shown where relatively high levels of radioactivity are present in scattered exposures. Black shale formations also underlie a considerable part of the Hudson Valley area. Here the formations with elevated radioactive content outcrop in an irregular manner which has not been mapped in detail for the entire area.

These maps include all generalized radiological information available at the time of report preparation. It should be emphasized, however, that the data are not complete. Little or no informa-

tion based on field measurements is available for much of the unmarked areas. The absence of data does not, therefore, necessarily indicate the complete absence of rocks with relatively high levels of radioactivity. Spot anomalies may be expected in many areas. Major surface exposure of such materials, however, may be assumed to be recorded.

Glacial Material

Except for a small area in southern Cattaraugus County, all of New York State has been glaciated. The ice moved generally southward into New York from centers of accumulation to the north. Glacial till, or boulder clay, an unsorted deposit, was left by the melting ice over most of the state. The retreat to the north was marked by several periods of equilibrium of ice advance and melting so that the ice front remained stationary long enough to pile large amounts of debris, called recessional or terminal moraines, at the static ice front.

Melt water draining to the south through valleys which had been widened and deepened by the glacier deposited large amounts of glacial outwash in them. These valleys are located primarily in the southern part of the state in the Allegheny Plateau.

When the edge of the ice was melted back to a position north of the drainage divide, the bulk of the glacier blocked the drainage and the melt water became ponded between the glacier edge and the higher land of the divide. Debris was washed into these ice dammed lakes with a sorting of the rock material during deposition which produced deposits of fine silt and sand.

Composition of the different types of glacial deposits is extremely variable. Composition is, however, directly related to the nearby bedrock which usually supplied the predominant material in the deposit. The relative resistance of the rock determined the persistence of the rock in the drift. The igneous rocks, being the hardest, are often found hundreds of miles from the outcrop.

Radioactivity levels for glacial material are directly related to the type and level of the parent bedrock and the composition of the overburden. McKeown[3] found abnormally radioactive glacial material up to ten miles from the bedrock source. The fine sands and silts of water-laid deposits are generally lower in radioactivity than the till, or ice-laid morainal material, in the same area.

A state-wide mapping of the distribution of glacial material is illustrated in Figure 4. This represents a compilation of available data from various authorities. Fairchild[9] mapped glacial deposits for the central and western parts of the state and his maps were used extensively. Mapping of moraines in the eastern part of the state was spotty and the data were gathered, where available, from various authors. Major terminal and recessional moraine deposits are mapped under the designation of "drift border." General till cover was not included in the mapping because of its wide distribution.

Association of the Incidence of Malformations with the Distribution of Materials with Relatively High Concentrations of Radioactive Elements

Classification of Townships on the Basis of Geological Data

Before the malformation data for all local areas became available, a classification of all townships and cities in Upstate New York was made pertaining to the probable or unlikely presence of extensive quantities of materials with relatively high concentrations of radioactive elements. The classification of "probable" was made when a township or city fell within one of the three following categories:

Figure 4—Pleistocene deposits

EXPLANATION—This map is a compilation of data from various sources. Only those deposits extensive enough to be important are shown. The following reference sources were used: 1 Fairchild, 1907; 2 Brigham, 1929; 3 Fairchild, 1932; 4 Woodworth N. Y. S. Mus. Bull. No. 83; 5 Woodworth N. Y. S. Mus. Bull. No. 34; 6 Tarr, 1909; 7 Brigham G.S.A. Bull. No. 8; 8 Taylor, 1924; 9 Rich, 1935; 10 Apfel, 1944; 11 Fuller, 1914; 12 Fairchild N. Y. S. Mus. Bull. No. 160; 13 Langey, 1952; 14 ground water bulletins.

1. Igneous bedrock areas.
2. River valleys in the Allegheny Plateau.
3. Terminal or recessional moraine areas with igneous or black shale outcrops occurring within a 25-mile distance to the north of the center of the city or township.

Townships and cities not falling within these three categories were classified as "unlikely."

The igneous bedrock category was selected because this rock type contains the highest concentration of radioactive elements found in natural materials within New York State. River valleys in the Allegheny Plateau were included because of the extensive glacial deposits in these locations with the presence of both igneous and black shale components. Morainal areas were also included, despite smaller deposits on upland slopes, when a confirmed outcrop of igneous or black shale material was present within an arbitrary 25-mile distance from the direction of glacial ice movement. The 25-mile distance was selected on the assumption that the great majority of all radioactive glacial materials present would have been derived from bedrock sources within this area. Areas with mapped water-laid glacial deposits were excluded because of the relatively lower radioactivity levels of these materials.

Classifications were based exclusively on the state-wide maps of bedrock and

glacial material illustrated in Figures 3 and 4. Townships were classified as "probable" only when more than one-half of the total township area or the major population centers were associated with one of the designated categories.

Malformation Rates for Townships Classified According to Geology

Malformation rates among children of residents of all urban and rural areas, classified as to the probable or unlikely presence of extensive quantities of natural materials with relatively high concentrations of the radioactive elements, are shown in Table 4. For all "probable" areas the rate is 15.1 per 1,000 births, as compared with the rate of 12.8 for the "unlikely."

If geology is a factor in the incidence of malformation, one would expect the association to be less marked in the urban than in the rural areas, where there should be greater exposure to natural materials. Table 4 shows that this is the case with rates for the "probable" and "unlikely" rural areas being 15.8 and 12.9, as compared with the corresponding urban rates of 14.1 and 12.8.

Within the rural areas, the presence of igneous bedrock is assocated with a rate of 17.5. River valleys in the Allegheny Plateau and/or drift borders (terminal or recessional moraines) have a rate of 15.4. For river valleys the rate is 15.5, and for drift border areas, 15.0.

Table 5 shows malformation rates by type of malformation in the "probable" and "unlikely" rural areas. For every type of malformation, except Mongolism, the rate is higher in the "probable" areas.

It is difficult to test these differences for statistical significance, since their standard deviations are certainly larger than those obtained by assuming binomial distribution. It is possible however to test for the consistency of the pattern throughout the state.

Grouping the counties of the state into the six standard geographical regions

Table 4—Malformation rates per 1,000 resident live births* in areas classified as to probable or unlikely presence of extensive quantities of materials with relatively high concentrations of the radioactive elements: New York State, exclusive of New York City, 1948-1955

Presence of Extensive Quantities of Radioactive Materials	Total			Urban†			Rural		
	Births	Malformations No.	Rate	Births	Malformations No.	Rate	Births	Malformations No.	Rate
Total	1,242,744	16,369	13.2	690,506	8,925	12.9	552,238	7,444	13.5
"Probable"	191,003	2,893	15.1	76,670	1,084	14.1	114,333	1,809	15.8
Igneous bedrock areas, except those covered with water-laid glacial deposits	27,521	462	16.8	4,298	56	13.0	23,223	406	17.5
River valleys in the Allegheny Plateau, and/or drift border areas	163,482	2,431	14.9	72,372	1,028	14.2	91,110	1,403	15.4
"Unlikely"	1,051,741	13,476	12.8	613,836	7,841	12.8	437,905	5,635	12.9

* Exclusive of births to residents recorded in New York City and other states.
† Incorporated places having a population of 2,500 or more in the 1950 Census.

Table 5—Malformation rates per 1,000 resident live births, 1948-1955, by type of malformation in rural areas of New York State classified as to probable or unlikely presence of extensive quantities of materials with relatively high concentrations of the radioactive elements

Malformation Classification	"Probable" Areas		"Unlikely" Areas	
	Malformation	Rate	Malformation	Rate
All malformations	1,809	15.8	5,635	12.9
Central nervous system	254	2.2	857	2.0
Circulatory system	299	2.6	939	2.1
Hare lip, cleft palate	181	1.6	529	1.2
Digestive system	122	1.1	384	0.9
Genitourinary system	150	1.3	440	1.0
Skeletal system (club foot)	264	2.3	779	1.8
Bones and joints	148	1.3	466	1.1
Other unspecified malformations	356	3.1	1,104	2.5
Mongolism	35	0.3	137	0.3

shown in Table 6, we find that in each region the malformation rate for "probable" towns is greater than for the "unlikely," although the difference is very small for the Catskill-Pocono Highlands.

Of the 57 Upstate counties, 38 contain townships classified as "probable." The average difference in these counties between the rates for "probable" and "unlikely" areas is 2.9, with a standard error of 0.95. The probability of this difference occurring by chance is less than three in 1,000. In three counties all townships were classified as "probable," with an average rate of 14.3. In 16 counties all townships were classified as "unlikely," with an average rate of 11.3.

Association of the Incidence of Malformations with Geology and Socioeconomic Status

If the association of malformation rates with geology is not an accidental phenomenon, the question arises as to what factor, or factors, might be associated with both a higher incidence of malformations and geology. One such factor is the socioeconomic status of the population.

To test whether the differences in malformation rates between "probable" and "unlikely" areas could be due to differences in the occupation of the father, as stated on the birth certificates, punch cards for the 1952 births to residents of the rural areas of 20 nonmetropolitan counties were selected for tabulation. These were coded for occupation of the father according to the 10-digit classification employed by the Bureau of the Census. All the counties in the Adirondack Highlands and the Northern Allegheny Plateau were included except the metropolitan county of Albany. These were divided into residents of "probable" and "unlikely" areas, and each group tabulated into the five occupation categories shown in Table 7.

For all births in the "probable" and "unlikely" areas, the malformation rates were 16.4 and 13.3. For each occupation group the rate was higher in the "probable" than in the "unlikely" area, except for the group "service workers, laborers, and occupation not reported." The greatest difference was for the farmers and for the farm laborers: 21.6 versus 12.4.

Association of the Incidence of Malformations with Geology and Type of Public Water Supply

In areas of probable presence of extensive quantities of radioactive materials one would expect relatively higher levels of radioactivity in water supplies derived from ground sources (wells and springs), than in those derived from large surface waters (lakes and rivers).

There are 555 communities under 10,000 population in New York State, 499 of which are served by public water supplies. The sources of water for these systems include 255 from ground waters, 72 from lakes and rivers, 83 from brooks and streams, and 89 from mixed sources.[10]

Table 6—Regional malformation rates per 1,000 resident live births, by probable or unlikely presence of extensive quantities of materials with relatively high concentrations of the radioactive elements: rural area of New York State, 1948-1955

Region	"Probable" Areas		"Unlikely" Areas	
	Births	Malformation Rate	Births	Malformation Rate
Total rural area	114,333	15.8	437,905	12.9
Adirondack Highlands	18,613	17.8	37,018	12.1
Catskill-Pocono Highlands	10,895	14.2	11,430	14.0
Northern Allegheny Plateau	42,981	16.1	27,682	14.6
Northwestern Allegheny Plateau Border	16,989	15.3	11,020	13.7
Erie-Ontario-Mohawk Plain	19,136	14.8	165,103	12.1
Hudson Valley and Long Island	5,719	15.4	185,652	13.2

Table 7—Malformation data by occupation of father

Code No.	Occupation of Father	Death Rate from Malformations* Upstate Area	Rural Area of 20 Nonmetropolitan Counties, 1952					
			"Probable" Areas			"Unlikely" Areas		
			Births	Malformations No.	Rate	Births	Malformations No.	Rate
	Total	2.86	7,689	126	16.4	6,671	89	13.3
0, 2	Professional, managers, and officials	2.60	1,275	24	18.8	791	12	15.2
3, 4, 5	Clerical and sales personnel, skilled workers	2.75	2,090	30	14.4	1,747	21	12.0
6	Semiskilled workers	2.76	1,659	26	15.7	1,290	16	12.4
7, 9, X	Service workers, laborers, and not reported	3.59	1,553	22	14.2	1,396	22	15.8
1,8	Farmers and farm laborers	3.15	1,112	24	21.6	1,447	18	12.4

* Neonatal mortality (under 28 weeks) per 1,000 single white live births recorded Upstate to residents of that area, 1950–1952.

Table 8—Malformation rates per 1,000 resident live births, according to source of public water supply and the probable or unlikely presence of extensive quantities of radioactive materials: incorporated places under 10,000 population, New York State, 1948-1955

Source of Public Water Supply	"Probable" Areas			"Unlikely" Areas		
		Malformations			Malformations	
	Births	No.	Rate	Births	No.	Rate
Total	50,333	732	14.5	150,742	1,936	12.8
Wells and springs	15,307	259	16.9	60,894	783	12.9
Large surface (lakes, rivers)	11,195	139	12.4	31,275	371	11.9
Small surface (brooks, streams)	11,213	149	13.3	24,008	304	12.7
Mixed	12,618	185	14.7	34,565	478	13.8

Table 8 shows the births, malformations, and malformation rates for the residents of these communities, classified by type of supply according to their location in areas of probable or unlikely presence of extensive quantities of radioactive materials. In the "probable" areas the rate is highest, 16.9, in those communities deriving their water supply from wells and springs and lowest, 12.4, in those utilizing large surface waters. In the "unlikely" areas the rates differ very little by source of supply, with those communities which derive their supply from wells and springs having a rate of 12.9, and from large surface waters, 11.9.

Evaluation of the Role of Possible Etiological Agents in Producing Congenital Malformations in Areas with Elevated Malformation Rates

An epidemiological field investigation was undertaken in an attempt to obtain information as to differences in the frequency of occurrence of known etiological factors between relatively high and low malformation rate townships. Comprehensive family interviews were carried out and more detailed geological field studies were made of these areas. The number of cases of rubella reported during each of the years 1949-1955 in the townships selected for field study was compared with the distribution of malformation cases during the same period. Possible biases in the malformation rates due to different reporting practices by hospitals and the role of sampling variation in the selection of high and low rate townships for special study were also evaluated.

Families were interviewed by staff public health nurses to obtain detailed family residence and occupation data extending through the grandparents of children designated on the certificates. The residence history included urban-rural status, source of drinking water, utilization of natural stone as a home construction material, presence of dust as a nuisance condition, and the utilization of a home garden for family produce needs. A history of all pregnancies as well as number, birth dates, weights, and health status of other children in the family was obtained. A familial history of malformations was recorded along with miscellaneous information pertaining to socioeconomic level, consanguinity, national stock, and religion. Data on the nutritional status of study families were not collected because of the difficulty of obtaining reliable information and the doubtful relationship

in man between malnutrition and congenital malformations.[11] The location of the 163 townships which were selected for the study is shown in Figure 5 below.

These investigations did not reveal the presence of other known etiological factors which were responsible for the malformation rate differences noted. The tabulation of the annual incidence of rubella revealed no association with the incidence of malformations.

Through the courtesy of Leonard Solon, acting director of the Radiation Branch of the New York Operations Office, Atomic Energy Commission, and his co-workers,[13] 38 external environmental radiation measurements were made in Upstate New York. Measurements were made with a 20-liter ionization chamber in conjunction with a vibrating reed electrometer.

The outdoor penetrating environmental radiation levels were found to lie primarily in the interval of 8 to 12 microroentgens per hour. This represents 2.1 to 3.2 r per 30-year period. The radiation associated with igneous rock areas was generally responsible for the higher levels. Appreciable departures from this range were found at points adjacent to exposed rocks having relatively high concentrations of radioactive materials. Occupational exposure associated with such materials was recorded as high as 40 μr per hour. Exceptions also occurred in association with buildings constructed with materials with elevated radioactivity. A reading of 18.5 μr per hour was made in the one building constructed with granite rock in which an ionization chamber measurement was made. This latter measurement was in contrast to a general environmental reading of 9.5 made outside the building.

"HIGH" MALFORMATION RATE AREAS
"LOW" MALFORMATION RATE AREAS
RESIDENCES OF FAMILIES WITH "MALFORMED" CHILDREN
RESIDENCES OF CONTROL FAMILIES WITH A "NORMAL" CHILD BORN DURING 1950–55

Figure 5—Distribution of field study areas and family residences

Through the cooperation of the Atomic Energy Project at the University of Rochester School of Medicine and Dentistry, 18 water samples were analyzed for radioactivity levels by Dr. John Hursh. A description of Dr. Hursh's analysis procedures has already been published.[14]

Preliminary screening measurements of water samples from both high and low malformation rate areas were made with the intent of picking up any highly radioactive ground source. A sample from a drilled well containing 29×10^{-16} gm of Ra266 per ml represents such a source. This sample was taken from the igneous rock area of the Adirondacks. The sample showing the next highest level at 5.2×10^{-16} gm was also taken from an igneous section in Putnam County, within the Hudson Highlands. These levels are in contrast to a general range of from 0.0 to 1.7×10^{-16} gm of radium per ml found in public water supplies.[14] Measurements of emitters from the thorium chain are not complete. Initial findings, however, reveal no evidence of substantial amounts of these emitters in the samples collected. Preliminary examinations for trace elements have not revealed any notable differences between samples from the various areas.

Radon measurements for mines in the Adirondacks, which were carried out by the New York State Department of Labor and the New York Operations Office of the Atomic Energy Commission, were found to be between 10^{-10} and 10^{-11} curies per liter in the majority of places sampled.[12] The former levels exceed the present maximum permissible concentration of radon and radon daughter products of 10^{-11} c per liter.

Bone and tissue specimens from lifetime residents coming to autopsy are also being collected in certain study areas for future radiological measurements by the Atomic Energy Commission's New York Operations Office.

Discussion

The foregoing data represent an epidemiological fact-finding study. The associations noted are statistical in nature and represent a first step in establishing possible cause-effect relationships. It should be stressed that the associations relate to total malformation rates and the location of geographical areas containing materials with relatively high concentrations of radioactive elements. This is not tantamount to a direct relationship with external environmental radiation levels or "background" radiation.

The study and the study data are also not comparable to the studies of the effects of atomic blast radiation in Japan[15] or to the majority of animal studies dealing with ionizing radiation. The latter studies have been related almost exclusively to high dose, external radiation administered over short periods of time. In contrast, the environmental radiation factors herein described pertain to low dosage levels over long periods of time. With many families, the time factor has included several generations. The sources of radiation, in addition to external radiation, include internal emitters which may have been ingested with food or drinking water, or inhaled.

The data upon which this report is based relate to such a substantial number of births that most of the differences indicated would be statistically significant by whatever tests devised. However, the real significance lies in the overwhelming consistency of the pattern which is shown in the relationship of malformation rates to geology. The data are crude with factors other than chance variation operating. Some of the most convincing evidence may be found in a comparison of the maps of bedrock, glacial material, and malformation rates illustrated in Figures 1–4. Interrelationships of these three items are per-

haps most readily illustrated in the area immediately to the south and southeast of Rochester. A 150-mile eastwest section of the drift border of the Mankato glacial substage is associated with elevated malformation rates only in a 40-mile section which lies immediately to the south of an outcrop of relatively highly radioactive black shale.

Special attention should be directed to the general range of external environmental radiation of 8-12 μr per hour and the fact that the higher readings are primarily associated with igneous bedrock areas. Although possibly of significance only in the matter of relative values, the 50 per cent increase in the level of the higher radiation figure over the lower is similar to the difference between the malformation rates of 12.9 and 17.5 found in Table 4. These latter rates reflect the differences found between rural areas classified as probably not containing relatively large quantities of materials with elevated radioactivity versus those containing more highly radioactive igneous materials.

The general absence of unusually high external environmental radiation levels in river valley and morainal areas is offset by the potential radiation exposures to man via ground water used for drinking purposes. Epidemiological justification for this consideration is found in Table 8 where higher rates in these areas are associated with consumers of ground water supplies in contrast to large surface supplies. These data suggest that an internal factor acquired through drinking water may play a more important role than an external agent.

The association of increased malformation rates with residence in areas containing materials with relatively high levels of radioactivity strongly suggests radiation as a primary etiological agent. However, another etiological agent which may be associated with radioactive materials may be responsible for the differences noted. Such an agent, however, is presently unknown and no known etiological factor other than radiation has the same statistical association with the malformation differences which are recorded. This applies to rubella, medical radiation, socioeconomic status, consanguinity, and the many other factors investigated in this study. Until such time as the existence of an alternate agent can be elicited, it would appear desirable to consider radiation as a causal agent. If such a causal association can be confirmed, it would serve as the basis for establishing more realistic and reliable information and standards pertaining to the long-range effects on man of low level, environmental radiation than those which have been extrapolated from laboratory experimentation with Drosophila and mice. Such information would be of special value in evaluating the hazards of environmental contamination by radioactive wastes and of fallout materials. Extensive additional radiological measurements will be required, however, before accurate estimates of these possible relationships can be made.

Summary

1. A tabulation was made of all congenital malformations recorded for children born during 1948-1955 in New York State, exclusive of New York City. Birth certificates, or certificates of death of children under five years of age, were used as sources of information. There were 16,369 malformations among 1,242,744 live births, an incidence of 13.2 per 1,000 live births. For the rural area the rate was 13.5. Rates of 20.0 or higher occurred in 186 out of a total of 942 townships. Contiguous groupings of these high rate townships occurred primarily in the Adirondack Mountains, Hudson Highlands, and Allegheny Plateau portions of the state.

2. An independent compilation was made of all available geological data

pertaining to deposits of materials with relatively high levels of radioactivity. These data were used to classify all townships as to the probable or unlikely presence of extensive quantities of natural materials with relatively high levels of radioactivity. The malformation rate for all rural areas classified as "probable" was 15.8 per 1,000 live births. For "unlikely" rural areas the rate was 12.9. The most highly radioactive materials in New York State are found in areas with outcrops of igneous rocks. These areas had the highest malformation rate, 17.5. Areas with extensive deposits of glacial materials had a rate of 15.4. These included river valleys in the Allegheny Plateau and glacial moraine areas. Areas with less extensive glacial deposits had a lower rate.

3. Birth record data pertaining to occupation of father were used to evaluate the relationship between malformation rates, presence of radioactive materials, and socioeconomic status. The neonatal mortality rate from malformations was inversely related to socioeconomic status as indicated by occupation of father. However, there was no relationship between socioeconomic status and the presence of radioactive materials. In "probable" radioactive material areas malformation rates were higher than in "unlikely" areas for all but one occupational group.

4. Data pertaining to source of public water supply were used to evaluate the relationship between malformation rates, presence of radioactive materials, and drinking water from wells and springs as contrasted with large surface supplies (lakes and rivers). In areas of "probable" radioactive materials the malformation rate was highest, 16.9, in communities deriving their water supplies from wells and springs, and lowest, 12.4, in those utilizing surface waters. In the "unlikely" areas the corresponding rates were 12.9 and 11.9.

5. Groups of contiguous townships with relatively high and relatively low malformation rates were selected for special epidemiological field study. There were no differences between the high and low rate areas in the distribution of births by age of mother, age of father, number of previous children born to mother, or occupation of father. There were also no differences in infant mortality after the first month, or in the stillbirth rate. Possible biases associated with different reporting practices by hospitals, sampling variation in the selection of field study areas, and general underreporting of malformations were investigated and could not account for the difference in rates between the high and low rate townships. There was no association between the incidence of rubella and malformations in any of the townships. Extensive family interview data revealed that medical radiation, infectious disease during the first trimester of pregnancy, and other potential etiological factors were not responsible for the malformation rate differences noted.

6. Field measurements of external environmental radiation levels were found to lie mainly in the interval of 8-12 μr per hour with appreciable departures from this range at points adjacent to exposed minerals having an elevated radioactive content. These levels represent a range of from 2.1 to 3.2 r per 30-year period. Preliminary screening measurements of radium 226 for a limited number of water supplies revealed one highly radioactive supply, from an igneous rock outcrop area, which contained 29.0×10^{-16} gm per ml. This level is in contrast to a general range of from 0.0 to 1.7×10^{-16} gm of radium per ml found in public water supplies.[14]

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NOTE: Additional information on this subject is available upon request from the author.

Why do people accept or reject health examinations? In preparation for this aspect of the National Health Survey, a study was undertaken to determine the characteristics and attitudes of those willing to have such examinations and of those who reject them. This is a preliminary report on the findings.

MOTIVATIONS TOWARD HEALTH EXAMINATIONS

Paul N. Borsky and Oswald K. Sagen, Ph.D., F.A.P.H.A.

AN UNSATISFACTORY RESPONSE rate can wreck the best planned and best constructed sample survey when it comes to imputing the results of the survey to the general population from which the sample was drawn. Similarly, noncooperation on the part of the public can effectively block the best protective measures in public health. Since response vs. nonresponse is principally a question of human motivations, the U.S. National Health Survey undertook to investigate public attitudes involved in willingness and unwillingness to participate in health examinations conducted for survey purposes.

This study on attitudes toward health examinations was designed, first, to develop hypotheses concerning factors which may influence willingness to participate in the examination and, second, to test these hypotheses. Other health surveys* which collected data by examination demonstrated that a serious problem existed in gaining public cooperation. None of them had built into their plan any scheme for determining the factors and evaluating performances in terms of motivation. Chen and Cobb[6] made a postexamination attitude survey in the Pittsburgh arthritis study and identified certain attitudes and behavior problems. The National Opinion Research Center had conducted several national surveys relating to attitudes toward health and health problems[14,15] and so was prepared to extend its investigations into the specific question of cooperation in health examinations.

The basic plan of the National Health Survey for conducting health examinations on a representative sample of the national population is first to conduct a household interview in a stratified probability sample of U. S. households and then persuade a random member of the household to accept a health examination conducted by the survey.† At the outset, the National Health Survey plans to limit examination to adults under 65 years and later to extend examinations to the older and younger age groups. The present study was planned within this framework on a national sample of households.

The Study Design

In February and March, 1958, a supplemental question was added to the

* Participation rates reported by these surveys are given in Table 1.

† An alternate plan is to examine all members of the household. Further study is required before final decision is made to take one or more than one from a household. For a description of the NHS health examination survey see pages 9–10 of reference 17.

National Health Survey interview, asking, "As part of the Health Survey, the Public Health Service will provide a free health examination to some of the people we are interviewing. As you would expect, we cannot learn all we need to know about health just by asking questions—for some things we need actual measurements and tests. The examination will involve only one visit to a nearby place. If you are selected for this special free examination and the time and place are convenient, will you be willing to come? . . . How about (each related adult), do you think he will be willing to come?" The answers to this were considered as providing a first-line indication of intent on the part of those interviewed.*

The detailed inquiry into attitudes of the persons answering the foregoing question was carried out by NORC in those urban areas within the National Health Survey sample areas wherein NORC maintained interviewers for its own national probability sample. NORC constructed a schedule of 55 attitude questions which were pretested in 50 New York City households. This hour-long interview was then administered by NORC about three or four weeks after the NHS household-interview by the Census Bureau.

While the sample interviewed by NORC cannot be said to represent properly the U.S. urban population, its distribution was a fair approximation to it. No attempt is being made to adduce numerical estimates based on this sample. However, the selective aspect of the sample does not preclude a good appraisal of the existence or nonexistence of factors sought in this study. Table 2 shows the distribution of the 762 attitude interviews completed from 835 households assigned for interview. A single individual, restricted to the age group 18-65 years, was interviewed in each household, with the respondent selected at random from eligible males in one household and from eligible females in the next.

Considerable information is available about nonrespondents to the NORC interview from the information obtained in advance from the regular NHS interview by the Bureau of the Census. The nonrespondents did not differ significantly from respondents with respect to sex, age, race, family status, work status, income, education and recency of visits to a doctor. The proportion of self-respondents to census interview was also not significantly different in the two

* As this is written, machine tabulations of these data from the nation-wide NHS sample have not been completed.

Table 1—Acceptance of medical examinations in four population surveys

	Medically Examined	
	Persons	Per cent of Base Population
Hunterdon County[1] (1952–1955) (Commission on Chronic Illness)	846	72 (weighted)
Baltimore[2,3] (1953–1955) (Commission on Chronic Illness)	809	63
Pittsburgh[4,5] (1953–1954) (Arthritis Study, U. of Pittsburgh)	429	61
Wales[6-8] (1950–1957, 1953) (Pneumoconiosis Studies, Medical Research Council)	?	89 to 95

Table 2—Distribution of NORC attitude interviews

	Proportions For Self-Weighting Sample in Per cent	Completed Interviews		Interviews Assigned	
		Number	Area Distribution in Per cent	Number Assigned	Per cent Completed
Total, U. S. urban	100.0	762	100.0	835	91.3
East	31.7	237	31.1	261	90.8
North Central	28.4	231	30.3	253	91.3
South	24.8	156	20.5	165	94.5
West	15.1	138	18.1	156	88.5
Urbanized areas:					
Large metropolitan (over 1,000,000)	42.5	386	50.6	434	88.9
Small metropolitan (under 1,000,000)	32.3	277	36.4	299	92.6
Other urban places	25.2	99	13.0	102	97.1

groups. The only significant finding is that more of the nonrespondents to NORC said "no" to the census on the question about accepting a health examination. In view of this finding, the reader is again cautioned against assuming that the rates of cooperation reported in Table 3 are valid estimates of the cooperation to be expected from the general population. Obviously, the reported rates tend to overstate slightly the cooperation obtainable from the general population, because they fail to take into account these nonrespondents.

Findings in National Survey of Attitudes

The 55 questions in the NORC interview were directed toward ascertaining from the respondent:

1. his own evaluation of the current state of his health and health needs;
2. his interest in health and the sources of his information on health;
3. his attitude toward, opinion of, and experience with doctors;
4. his opinion on medical research expectations and his knowledge of certain kinds of disease symptoms;
5. his opinion of the government's function in research, health and medicine, and his attitude toward public health and the Public Health Service;
6. his expectations with respect to the health examination which he had been asked to take;
7. persons who might influence his decision;
8. the amount of inconvenience and other conditions surrounding the examination arrangements which would influence his decision, and whether his cooperation hinged upon other members of the household being examined.

The NORC questions on willingness to participate in the health examination were asked to determine the firmness of the replies in terms of "will certainly come," "will probably come," "probably won't come," and "don't know." In the analysis the latter two are combined as "NORC:No" and the first two as "NORC:Yes."

Without urging, 71 per cent told the census interviewer "Yes," but of these one out of ten changed his position when interviewed by NORC. Analysis of the NORC interviews indicates that those who changed from "Yes" to "No" are distinct as a group in several respects. The group for whom the initial answer was "No" to census but who later said "Yes" to NORC constituted 12 per cent

of all persons interviewed, and is also distinguishable on the basis of certain rather specific characteristics. These changes did not come about on the basis of any pressure by the interviewers, since NORC did nothing more than ask questions about the respondent's reactions to general health matters and to the alternative ways in which a health examination could be given. It appears that in some instances the NORC questioning may have helped the interviewee to think the matter through and reconsider his original answer.

The question on willingness to accept the health examination was always asked of the specific sample person by NORC, but census, in accordance with the standard practice of the National Health Survey interview, accepted proxy responses from within the family.* Proxy respondents tended to be more cautious in saying "Yes" than those who responded for themselves. It is notable that the only response class with a distinctly larger proportion of proxy responses (54 per cent) in the census interview was that for which the initial response of "No" became "Yes" to NORC. In the other response classes, the proxy responses were uniformly only one out of three. This factor also helps explain the significantly greater number of changes from "No" to "Yes" with males, because a high proportion of proxy responses is from housewives answering for males in the family who were away at work during the interview.

There are enough differences in the distribution of personal characteristics, viewpoints, and attitudinal reactions to differentiate the groups which fall into the several classes of response on the question of accepting a health examination under the described conditions. Although some of the differences are small and not statistically significant by themselves, the fact that so many of them fall in the same direction bolsters confidence in their existence as significant factors. Additional research is needed, of course, for more definite and precise appraisals.

Of the 11 personal variables on which information was collected, seven partially separate the cooperators from the noncooperators, while four are about the same in all groups. All of the personal variables, however, show less influence on the respondent's intention to cooperate than the psychological factors which will be discussed below. Cooperators are more often nonwhite, younger and middle-aged, veterans, in the lower income groups, and persons living in southern or western urban centers. People are more apt to agree for themselves to come for the examination than to agree on behalf of other members of their family. The less certain cooperators generally have more education, but the consistent "Yes" and "No" groups show no significant differ-

* The NHS interview procedure is summarized in pages 5–6 of reference 18.

Table 3—Expressed intent to census and NORC on accepting examination

	Total		Census: Yes		Census: No		Census: DK & NA*	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Total	762	100.0	539	70.7	171	22.5	52	6.8
NORC: Yes	614	80.6	486	63.8	92	12.1	36	4.7
NORC: No	148	19.4	53	6.9	79	10.4	16	2.1

* DK is "Don't Know" and NA is "Not Answered"

Table 4—Personal characteristics of response classes—percentage distribution

	Total	Census: YES		Census: NO		Census: NA & DK	
		NORC:		NORC:		NORC:	
		Yes	No or DK	Yes	No or DK	Yes	No or DK
Number of Respondents	762	486	53	92	79	36	16
Per cent of total	100%	100%	100%	100%	100%	100%	100%
White	86	82	89	94	95	97	94
Nonwhite	14	18	11	6	5	3	6
Male	50	47	55	62	49	61	44
Female	50	53	45	38	51	39	56
Age							
18–34 years	32	32	38	34	19	42	56
35–49 years	36	39	28	37	27	42	25
50–65 years	32	29	34	29	54	16	19
Annual family income							
Under $3,000	19	22	25	11	13	—	13
$3,000–$4,999	27	28	27	32	23	12	40
$5,000–$6,999	27	28	13	26	26	41	20
$7,000 and over	27	22	35	31	38	47	27
Education							
Grade school	26	28	34	19	23	14	25
High school	51	52	32	55	58	39	37
College	23	20	34	26	19	47	38
Self and proxy response							
Self-respondents to census	64	68	64	46	71	88	50
Proxy-respondents to census	36	32	36	54	29	12	50
Family relationship							
Head	59	59	58	63	56	70	50
Wife	32	34	32	27	32	19	44
Child	5	3	6	6	6	11	6
Other relative	3	3	2	4	4	—	—
Unrelated	1	1	2	—	2	—	—
Marital status							
Married	77	76	73	83	79	82	81
Widowed	6	7	6	3	6	—	6
Divorced	4	5	4	2	5	3	—
Separated	4	4	4	4	—	3	—
Never married	9	8	13	8	10	12	13
Labor force status							
Working	63	61	61	67	66	78	62
Looking for work	1	1	1	1	1	—	—
Keeping house	31	33	34	23	28	22	19
School	2	2	3	2	1	—	19
Other	3	3	1	7	4	—	—
Veteran status (males only)							
Veteran	46	50	49	37	31	56	57
Nonveteran	54	50	51	63	69	44	43
Region							
East	31	28	34	35	49	22	19
Midwest	29	30	34	26	27	25	13
South	20	18	15	29	11	42	55
West	20	24	17	10	13	11	13

ences with respect to education. Practically no differences are found regarding sex, family relationship, marital status, or labor force status.

Our findings with respect to age and sex are consistent with other research reports. But findings regarding self-response, income, education, and marital status are different from some of the other research reports. It is difficult to explain these inconsistencies, but the lack of comparability among survey designs and procedures must be remembered as a possible cause.

The amount of material on attitudes obtained in this study is far more than can be presented here. Table 5 presents a selection of the answers on which the most pertinent divisions of opinion occur between the various classes of response to the question on accepting a health examination. The consistent cooperators, i.e., those who said "Yes" to census and also to NORC, express definitely more need and desire for medical attention than the others. In reporting on chronic illness, the consistent cooperators report more conditions and more often would like to talk to a doctor about themselves. They are less satisfied with the amount of current research on causes and cures of disease and believe that more should be done. With regard to household surveys, such as this study, they usually feel that it is "very important" for people to cooperate. In their appraisal of the economic and social impact of illness upon themselves and family, they more often characterize the problem as serious. The consistent cooperators more often evince interest in health matters and confidence in doctors. More of them also concede the possibility of experiencing a serious illness.

The consistent noncooperators, i.e., the "No-No" class, are largely composed of persons who express contrary views on these questions. More of them are well satisfied with the state of their current health, report fewer chronic illness conditions, express satisfaction with current research efforts, and consider it less important to assist studies such as this by cooperating in the study. Fewer express any desire to see a doctor, and fewer consider illness in themselves as a heavy financial problem and burden to them and their families. The consistent noncooperators as a class are less interested in health matters in their reading, radio listening, and TV watching. Also, fewer of them consider it likely they will encounter illness in the next year, and fewer claim they would consult a doctor immediately when symptoms appear. More have reservations about doctors' abilities to cure illness, even though they agree with the cooperators that doctors now know more, and have better medicines, than 30 years ago.

The "Yes-No" response class is of particular interest because other indications imply that success in gaining cooperation greatly depends on getting an initial "Yes" to the request for examination. There were 53 persons who shifted from "Yes" to "No." Their attitudes as revealed by our questions tend to represent viewpoints at the extremes. They report less chronic illness than the consistent noncooperators and seldom desire to talk to a doctor about their health. With regard to satisfaction with current research efforts, they are more like the cooperators and feel more could be done, but few of them feel it is important to cooperate in such studies as these. They feel less need for especially good health to do their work well, and report the least impact when illness strikes. Their interest and concern about health matters is the lowest, although their educational background is the highest. They feel that the way people live makes the least difference in how healthy they are and they more often recommend self-diagnosis for illness. Generally, they have less confidence in

Table 5—Some attitudes related to the response classes—percentage distribution of respondents in each class

	No. of Respondents*	All Respondents	Census: Yes		Census: No		Census: NA-DK	
			NORC:		NORC:		NORC:	
			Yes	No-DK	Yes	No-DK	Yes	No-DK
Number of Respondents	762	(762)	486	53	92	79	36	16
All Respondents	(762)	100%	100%	100%	100%	100%	100%	100%
Presence of chronic illness or symptoms								
None	346	46%	42%	53%	62%	42%	50%	37%
One	216	28	28	30	23	38	22	38
Two or more	200	26	30	17	15	20	28	25
Self rating of own health								
Excellent	238	31%	28%	40%	33%	33%	50%	31%
Good	343	45	45	41	52	38	39	50
Fair	149	20	21	17	15	27	11	13
Poor	32	4	6	2	..	2	..	6
Like to consult own doctor free of charge?								
Desirous	307	40%	48%	28%	32%	16%	33%	31%
Not desirous	453	60	52	72	68	84	67	69
Satisfied with medical research								
On causes? Yes	521	68%	68%	64%	61%	84%	69%	63%
No	241	32	32	36	39	16	31	37
On cures? Yes	509	67	68	66	55	77	67	69
No	253	33	32	34	45	23	33	31
Kind of health required by own work								
Especially good health	244	32%	33%	17%	33%	30%	42%	31%
Fairly good health	376	49	50	47	49	49	50	44
Not so well health	136	18	17	34	18	18	8	25
Don't know health	5	1	0	2	..	3	..	..
Trouble for family if you are sick?								
Great deal	92	12%	13%	19%	8%	10%	..	12%
Some	177	23	26	6	24	17	25	19
Not much	432	57	52	66	64	63	75	63
No family	60	8	9	9	4	10	..	6
Listen or watch health programs on radio and TV								
Often	176	23%	24%	19%	26%	19%	28%	6%
Once in a while	329	43	46	29	47	34	42	31
Hardly ever	256	34	30	52	27	47	30	63
Why listen or watch hardly ever?								
Avoid all programs	86	11%	12%	8%	19%	13%	3%	13%
Avoid health	144	19	15	36	16	29	19	50
None available	25	4	3	8	2	5	8	..
The way you live affects your healthiness								
A great deal	426	56%	55%	47%	65%	58%	56%	62%
Some	194	26	26	23	20	24	36	19
Hardly any	133	17	19	26	14	13	5	19
Don't know	9	1	0	4	1	5	3	..

* Some respondents failed to answer every attitude question and therefore the total number of respondents is not necessarily 762 for each question.

Table 5—Some attitudes related to the response classes—percentage distribution of respondents in each class (continued)

	No. of Respondents*	All Respondents	Census: Yes		Census: No		Census: NA-DK	
			NORC:		NORC:		NORC:	
			Yes	No-DK	Yes	No-DK	Yes	No-DK
Number of Respondents	762	(762)	486	53	92	79	36	16
Likely to get TB, heart disease or arthritis 5-10 yrs?								
Very likely	53	7%	8%	2%	3%	6%	11%	6%
Fairly likely	134	18	20	11	21	10	11	13
Hardly likely	507	67	65	70	71	66	75	75
Don't know	66	8	7	17	5	18	3	6
From a list of 11 conditions, believe that doctors can cure or help								
7 or less conditions	60	8%	6%	15%	10%	16%	3%	13%
8 conditions	48	6	7	6	1	10	..	6
9–11 conditions	654	86	87	79	89	74	97	81
From a list of 11 symptoms, should see doctor immediately about any of								
6 or less symptoms	170	22%	19%	40%	29%	27%	11%	31%
7 or 8 symptoms	245	32	34	34	27	32	33	6
9–11 symptoms	347	46	47	26	44	41	56	63
Reasons for not wanting a check-up from doctor†								
Makes you worry	116	15%	14%	17%	13%	24%	11%	19%
Get better by self	88	12	10	19	12	14	8	19
Are OK if feel OK	492	65	63	64	64	73	50	88
Doctor might hurt	52	7	7	11	6	6	13	6
Doctor can't help	42	6	5	11	1	8	8	12
Criticisms of doctors†—some or most doctors								
Don't let you tell exact trouble	287	38%	41%	47%	27%	30%	34	25%
Don't take enough personal interest	259	34	33	42	30	36	36	44
Aren't careful or gentle enough	110	14	15	23	11	9	11	25
Charge too much	320	42	42	53	39	38	34	56
Role of government in health†—government								
Has no business in health	69	9%	8%	15%	6%	13%	6%	31%
Should test all vaccines	680	89	91	77	94	80	86	100
Should give free doctor's services to needy	679	89	91	91	87	84	86	75
Should provide health insurance	482	63	68	43	65	53	56	50
Should give money for research in private institutions	606	80	83	72	76	71	78	62
Should make studies on the Nation's health	717	94	96	89	98	85	94	81
Should set up its own laboratories for research	607	80	82	68	83	66	92	69

* Some respondents failed to answer every attitude question and therefore the total number of respondents is not necessarily 762 for each question.

† Percentages do not add to 100 since every question was asked separately and percentages represent extent of agreement with each statement.

doctors' abilities to cure diseases and are least satisfied with doctors' concern and manner in patient care. It is interesting to note that these critical attitudes toward doctors are not based on reported experiences but on the result of impressions of doctors in general. This "Yes-No" group also feels that the role of government in health matters should be restricted. Moreover, they tend to be concentrated at the two extremes with respect to age, income, and education.

As mentioned earlier, the shift from "No" to "Yes" is partially explained by the census procedure of accepting proxy responses. Over half of the sample persons in the "No-Yes" group were not interviewed for themselves by the census. An analysis of the sample persons with proxy census interviews reveals that they considered themselves in very good health and also believe in regular doctor visits. Since less than half of these persons had seen a doctor in the past year, it is reasonable to assume that the offer for an examination came at an appropriate time to induce a "Yes" response. It is also reasonable to assume that if they had been interviewed by census directly, they probably would have said "Yes" in the first instance.

With respect to basic attitudes, the whole "No-Yes" group more nearly resembles the consistent cooperators. They report the least number of chronic illnesses but more often feel the need for additional doctor consultations than the noncooperators. They are least satisfied with current medical research, and almost all of them feel cooperation on this study is important. There is a high interest in health matters and when illness strikes, the impact is almost as high as with the consistent cooperators. They feel less threatened by the possibility of getting seriously ill, but they strongly believe in regular checkups. The "No-Yes" group is most satisfied with, and confident of, doctors' skills. They believe in seeing a doctor promptly when symptoms become apparent.

Field Test of Health Examination Survey Technics

Utilizing preliminary findings in the national survey of attitudes, procedures were set up for producing examinees at a pilot project for the health examination survey. This project was conducted in Washington, D. C., on a population sample drawn from the metropolitan area especially for the pilot study. Census interviewers gave the regular National Health Survey interview in each sample household, and at its conclusion, asked the supplementary question on willingness to accept a health examination. The question was asked of just one person from the household in the eligible age range of 18-64 years. The selection of the particular eligible was on the basis of a predetermined procedure for a random choice. No proxy response was accepted on the supplement question and return visits were made to interview the potential examinee in person. If the census interviewer received a "Yes" answer, she immediately made an appointment for the examinee by calling the survey office. While the census interviewer was under instructions to explain the content and arrangements for the examination, she was not under instructions to try to persuade those who failed to give their immediate and ready assent. Persuasion efforts were planned for a second-stage visit. Making the appointment included scheduling a taxicab (at no expense to the examinee) to transport him to the examination center. Some of those who answered "Yes" to the supplemental question were not able nor willing to make a definite appointment at the time of the census interview. These together with those who said "No" were visited subsequently either by an

Table 6—Examination appointments and response to initial invitation by census interviewer

	Total		Initial Answer to Census: "Yes"		Initial Answer to Census: "No"	
	Number	Per cent	Number	Per cent	Number	Per cent
Total	180	100	142	79	38	21
Appointment made	148	82	135	75	13	7
No appointment made	32	18	7	4	25	14

Table 7—Willingness to cooperate shown by white self-respondents in the national attitude survey and in the Washington, D. C., pilot project

	Total		Initial Answer to Census: "Yes"		Initial Answer to Census: "No"	
	Number	Per cent	Number	Per cent	Number	Per cent
National Attitude Survey						
Total	393	100	300	75	93	24
NORC: "Yes"	311	79	270	69	41	10
NORC: "No"	82	21	30	7	52	14
Pilot Project, Washington, D. C.						
Total	123	100	92	75	31	25
Appointment made	96	78	86	70	10	8
Appointment not made	27	22	6	5	21	17

NORC interviewer or by a "persuader" from the National Health Survey staff.

By inspection of Table 3 with Table 6 it is apparent that the distribution of answers to NORC in the national study in relation to answers to the census question correspond quite closely to the distribution of appointments in the pilot project. However, since the answers to census in the pilot project were by self-respondents only, it is more appropriate to compare Table 6 with the national data on self-respondents. Also, since the pilot project population was 32 per cent nonwhite in contrast to 14 per cent in the national study, the comparison is best made for white self-respondents.

From the foregoing table we are encouraged to believe that the question on willingness in the NORC interview closely reflects behavior in making an actual appointment for examination. Accordingly, the attitude factors which show up from the NORC interviews can be taken as initial guidelines in planning for the health examination survey technics to produce examinees. The next task is to analyze the problems involved in broken appointments, which, as can be seen from the following table, are considerable.

In the Washington, D. C., pilot project all sample persons who said "No" or "Don't know" to the census interviewer were visited by NORC and interviewed

Table 8—Appointments and actual examinations in the Washington, D. C., pilot project

	Total		Examined		Not Examined	
	Number	Per cent	Number	Per cent	Number	Per cent
Total persons with appointments	148	100	119	80	29	20
Original appointments by Census	131	88	107	72	24	16
Original appointments by NORC and persuaders	17	12	12	8	5	4
Reappointments after a broken appointment	37	25	16	11	21	14

with a questionnaire identical, except in minor respects, with the 55 questions of the national attitude survey. Also, an exit interview designed by NORC was given each person examined. The data from these interviews and the census household interviews are under separate study and will be reported at a later date.

Summary of Conclusions and Recommendations

Conclusions

A study of a national sample of the adult urban population indicates that the following types of people are more willing to cooperate on a free health examination: the nonwhite, younger and middle-aged, veterans, and lower income groups. Also, persons are more apt to commit themselves to cooperate on a health examination than to commit other members of their family.

Four basic attitudes and beliefs were demonstrated to be even more closely related to examination behavior than personal characteristics. These were:

1. Underlying attitudes and beliefs on health.
2. Beliefs as to the potential personal benefits to be derived from the health examination.
3. Beliefs as to the importance of furthering medical research.
4. Belief as to the reasonableness and appropriateness of the examination procedures and arrangements.

Each of these attitudes and beliefs is described briefly below:

1. Underlying Health Attitudes and Beliefs

Underlying the degree of receptivity to a free medical examination are five general health attitudes and beliefs. Cooperators more often report agreement with these attitudes and beliefs, while noncooperators generally report contrary beliefs.

(a) *The importance of good personal health as an objective in life.* Cooperators more often believe that especially good health is essential to do one's work well, and, therefore, strive to maintain good health. Likewise, illness more often presents them with serious social and economic problems.

(b) *Interest and concern in health matters.* Cooperators more often believe that the way one lives has a direct influence on one's health. They are also more interested in discussing, reading, and listening to educational health programs.

(c) *Belief of personal susceptibility to illness.* Cooperators more often admit the likelihood that they will be sick in bed during the next year and grant the possibility that they may become seriously ill in the next few years.

(d) *Belief of the need for professional diagnosis and care of illness.* Cooperators show less confidence in self-diagnosis and more often feel they can become sick without being immediately aware of it. They also more often feel they should see a doctor right away for professional diagnosis and treatment upon appearance of a symptom.

(e) *Belief in the ability of modern medicine to cure or help illness.* Cooperators more often

believe that doctors have the know-how and facilities to cure or help relieve illness and disease.

2. Belief as to the Potential Personal Benefits to Be Derived from the Health Examination

Cooperators usually state that they expect to benefit directly from the results of the examination. Underlying this strong personal motivation are the following three beliefs:

(a) *Dissatisfaction with personal efforts to care for health.* Cooperators more often feel they could do more to take better care of their health.

(b) *Recognition of some personally unmet health needs which are susceptible to medical care.* Cooperators more often report a desire to talk to their doctors about their health, and more often admit having felt the need to see a doctor without actually doing so for a variety of reasons.

(c) *Confidence in the skill and personal approach of their own doctor and doctors generally.* Based on their personal experiences and on what they have heard or read, cooperators generally are more confident in their own doctors and in doctors generally. Noncooperators report more criticisms of doctors and more often indicate a distrust of strange doctors by limiting their willingness to come for the examination to the case where their own doctor gives it.

3. Belief in Importance of Aiding Medical Research

The most frequent reason given for agreeing to cooperate on the health examination is a desire to help the government in its research efforts. Underlying this motive are the following three different attitudes and beliefs:

(a) *Recognition of the need for additional medical research efforts.* Cooperators are least satisfied with current efforts at finding causes and cures of disease. In addition, most people believe that research efforts will eventually succeed in discovering new cures for disease.

(b) *Recognition of the responsibility of government in maintaining the nation's health.* Cooperators more often approve of government taking an active role in health research and in programs to promote the nation's health.

(c) *Recognition of personal responsibility in assisting medical research programs.* Cooperators more often feel it is very important for them personally to cooperate on health research programs. Noncooperators more often question whether their cooperation is essential to the success of the program.

4. Approval of the Reasonableness and Appropriateness of Examination Procedures and Arrangements

This is the last of the major conclusions and involves the convenience and approval of the arrangements for the examination.

(a) *Items of convenience.* These include such considerations as: travel time, duration of examination, time of appointment, place of examination, mode of transportation provided, persons offered examinations, type of doctors giving examinations, and kinds of tests and procedures used. The cooperator must believe the above items are reasonable and he also must be able to fit them into his other obligations. As expected, arrangements which make the least demands upon a person are likely to produce the greatest cooperation.

(b) *Desire to behave in a socially approved manner.* Cooperators more often indicate that approval of the health examination by their spouses, friends, doctors, or other prestige groups would influence their decisions to participate in the examination. Noncooperators are more indifferent to the approval of the examination by their peer and prestige groups.

Recommendations

1. The initial offer to take the health examination should be made directly to the respondent himself. No proxy respondents should be used.

2. Potential noncooperators should be identified as early as possible through a series of screening questions.

3. The process of persuading should be combined with the initial offer of the examination. The interviewer should avoid offering the examination to anyone identified as a potential noncooperator. A specially trained persuader should call back on each potential noncooperator and make his full presentation at one visit. This will avoid initial

refusals and minimize any delay in providing the necessary persuasion efforts.

4. Appropriate graphic and explanatory material about the examination should be presented to each respondent. This material should indicate the types of tests, the types of equipment and facilities, and the pictures and background of the staff. Such information should instill confidence in the examination and reduce any fears or misconceptions about the expected experience.

5. Endorsements from local doctors and other important local personalities should be obtained whenever possible.

6. In stressing the personal benefits to be derived from the tests and measurements, each cooperator should be advised that the results of the examination will be made available to his own doctor, if he so desires. He should also be told that he will be notified when the data are sent to his doctor so he can contact him for a consultation.

7. Both the personal and general research benefits may be stressed with cooperators, but since noncooperators do not usually recognize the existence of unmet health needs, only the general research goals should be emphasized with them.

8. The examination procedures and arrangements should be arranged to meet the local and regional preference patterns with respect to modes of transportation, time of examination, types of endorsements, and so forth.

9. Considerable effort should be made to follow-up immediately on failures to keep an appointment, and doctors and facilities should be brought to the noncooperators to make it easier for them to cooperate and to emphasize the importance of their cooperation. The appointment rate of 82 per cent and the lower examination rate of only 66 per cent achieved in the pilot study in Washington, D. C., emphasize the importance of persuasion efforts.

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Mr. Borsky was study director and Dr. Sagen was project officer in charge of the study. Elijah L. White, supervisory statistician, National Health Survey Program, assisted materially in the design, conduct, and analysis of the study and was in charge of the appointments and persuasion efforts for the Washington, D. C., Health Examination Pilot Study referred to in this paper.

This paper constitutes a preliminary report on a methodological study by the National Opinion Research Center of the University of Chicago under contract with the National Health Survey Program, Division of Public Health Methods, Public Health Service, Department of Health, Education and Welfare. A more complete exposition of the study design and findings in detail will be incorporated in the Health Statistics Series of publications from the U. S. National Health Survey.

The U. S. Bureau of the Census cooperated in the work of the study by adding a supplement to the regular National Health Survey interview and coordinating its field work with the requirements of the study and in providing the basic demographic data on the interviewees in the NORC national sample. Special thanks are due Dr. Abbott L. Ferriss, Katherine G. Capt, and Samuel Dennis of the Bureau of the Census for their help in planning and their work in carrying out the first stage of the study.

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Canadian Association Jubilee Year

The Canadian Public Health Association invites members of the American Public Health Association to attend its 1959 annual meeting celebrating the 50 years of the association and the Canadian Public Health Journal. Joining in this jubilee meeting is the Society of Hygiene and Preventive Medicine of the Province of Quebec. It will be held May 31-June 3, at the Sheraton-Mount Royal Hotel in Montreal, Quebec, where "gaelic environment, spontaneous gaiety, and hospitality" are promised. F. Burns Roth, M.D., vice-president of the American Public Health Association, will bring the greetings of the American Group to their Canadian colleagues. All other members of the American Association are invited to attend.

An epidemic of erythema infectiosum occurred, at first unrecognized, from late 1956 through 1957 in the Detroit metropolitan area. The events and the problems they raise are discussed in this interesting paper.

ERYTHEMA INFECTIOSUM—REPORT OF AN AREA-WIDE OUTBREAK

Frank J. Condon, M.D., M.P.H., F.A.P.H.A.

ERYTHEMA INFECTIOSUM, an exanthematous disease with mild prodromata and symptomology and of moderate communicability, has been noted distinctively since 1886 when Teshmer[2,9] first observed "a peculiarly localized rubella" in Germany. It was first called erythema infectiosum by Stickler[2,3] in 1889 and was later described by Eshrick (Germany)[2] as a distinct clinical entity in 1896. Between 1886 and 1904 a number of epidemics of this disease were encountered in Germany and other adjacent nations of Central Europe and reports are found in the medical literature accordingly.[2,3]

H. L. K. Shaw[2,3] of Albany Medical College in 1905 provided the first description of the disease in American medical literature, having observed some cases in the Vienna Clinic of Eshrick. At a later date, 1919, Shaw and Branner[2] reported an epidemic of 37 cases in Albany, N. Y. Zahorsky[2] of St. Louis reported cases in 1914 and again in 1924. Herrick made the earliest clinical reports from cases that occurred in an outbreak in the United States at Cleveland, Ohio, in 1926.[2,9] Since that date occurrences of comparatively small circumscribed outbreaks have been reported from: Ogden, Utah, in 1924;[4] Bamford, Conn., in 1931;[3] Berkley, Calif., 1932;[6] Elmsford, N. Y., 1933;[2] San Francisco, Calif., 1940;[11] New York, N. Y., 1942;[2] Cuyahoga County, Ohio, 1951;[1] Compton, Calif., 1953.[12]

Although it was observed early in the European experiences to occur on a number of occasions concurrently with rubella, measles, or streptococcal (scarlet fever) outbreaks, it has been demonstrated that no cross-immunity with any of these conditions exists.[1,3] It has also been demonstrated as not having a streptococcal etiology.

The lack of cross-immunity (Table 1)[1,3] has likewise been evident in subsequent encounters both in this country and abroad. Its attack rate is as high among those having had attacks of those exanthematous conditions most likely to be confused with it, namely, measles, rubella, and scarlet fever, as it is in those not having had such experiences.

During the early months of 1957 some reference was made by a public health nurse in one of the school districts of southeast Oakland County, Mich., that an unusual behavior or course was observed in certain cases of exanthematous conditions that were variously diagnosed or considered in the main to be either rubella or scarlet fever. It was noted that a moderate number of cases of both conditions were being reported to the Health Department at the time. Also a pediatrician practicing in

this general area made the observation that a case resembling mild scarlet fever was subject to a recurring rash or other "allergic phenomenon" following the initial course and apparent recovery. On culturing the throat, beta A, Streptococcus hemolyticus was found and consequently little further importance was attached to the incident until a sibling later developed and experienced a similar condition running a parallel course. Subsequently cultures obtained from the throats of a representative sample of those developing this particular exanthematous condition failed to produce further streptococcal findings in a single instance.

In the ensuing weeks of late February and early March, 1957, scarlet fever, measles, and rubella were all reported in the southern part of Oakland County and the adjacent Detroit metropolitan areas with gradually increasing frequency, assuming moderate prevalence in late March and reaching peak incidence about mid-April. In step with this was the frequent observation that many suspect cases of the aforementioned conditions were following an atypical course. Physicians, school authorities, and public health nurses were becoming increasingly aware that many of the subjects were experiencing an exanthematous disease or other "allergic like condition" characterized by a transitory, evanescent rash with an unusual distribution. This was observed to occur and reoccur frequently in school children particularly, many of whom had already been excluded from school in accordance with the usual regulatory control measures commonly invoked when communicable diseases of similar character are encountered. It is understandable that the school and public health nursing personnel soon found themselves involved in something of a dilemma because of the impressive number of cases encountered and for whom supposedly an appropriate disposition had but recently been made. At first the inclination was to again exclude them from school on the assumption or suspicion that perhaps a second disease entity was affecting these individuals.

It soon became apparent, however, that the more orderly chronological course and progress of a distinctly different entity heretofore unfamiliar to the health and medical workers of the community was being encountered. Hence, further medical and epidemiological consultation and opinion was sought. Since both measles and rubella had been prevalent in the area the preceding year, an interesting phenomenon from an epidemiological and ecological standpoint was encountered; for not infrequently the subject presenting this exanthematous condition gave a history of having had one of several of those more commonly experienced conditions that were presently suspected. This fact in turn lends further substance to the previously mentioned suggestive evidence that a lack of cross-immunity exists between this newly encountered exanthem and the several more familiar conditions previously experienced and with which it was then being differentiated or confused.

By early April it was well recognized and established that erythema infectiosum had become quite prevalent, having spread in a concentric pattern from the focal area observed earlier. It is no doubt possible that a number of the earlier cases may have been erroneously considered and reported as one of the other exanthems previously mentioned and that efforts requiring differential diagnostic consideration were now in order. It was interesting to note at this point that for a given 150-sq mile area in south Oakland County previous to April 11, 86 cases of measles, 17 of rubella, and 21 of scarlet fever had been reported for that month.

Subsequent to that date eight cases of measles, 15 of rubella, and 16 of

Table 1—Erythema infectiosum

Name	Age	Onset	Prodromal	Rash Stage I., II., III.	Other Findings	Duration of Rash	Previous Exanthema	Complications	Other Cases 1. Sibling 2. Parents 3. Groups or classes in school	Remarks
1. D.W.W.	12	3–27		XXX		2 wks.+	Sc. fever and Measles		Brother	Observed and referred by pediatrician because of atypical rash
2. R.T.	9	4– 4	Temp., headache 24-36 hr. sore throat	XXX	Desquamation	3rd wk.	Ch. pox and measles			2% eosinophilia, neg. throat culture
3. G.C.	7	4–12		XXX		Continuing beyond 1 wk.	Not stated	Desquamation	5-6 classmates had same exanthema rash and were out of school	
4. R.J.	4	4–15		XXX		2 wks.	Measles and rubella		Sister had similar rash with conjunctivitis	Rash fades and returns during 3rd wk. when seen
5. K.R.	7	4–17	Yes, light sore throat	XXX	Post-auricular glands	2wks.+	Measles and rubella	Red throat, cough for 2 wks.	No. of absences among class and school mates	
6. R.A.	7	4–17	Temp. and sore throat	XXX			Measles, rubella and sc. fever			Neg. throat culture for Hemolytic strep.
7. J.B.	8	4–19	Temp.	XXX			Not stated		Yes, sister 17 yrs. had rash	Eosinophilia 3%, throat culture neg. for Hemolytic strep.
8. J.H.	8	4–21	Yes	XXX		2 wks.	Measles and rubella		2 brothers	2 brothers had rash 1 continued 3 wks. 1 continued 6 wks.
9. L.B.	17	4–24		XXX			Measles, rubella and ch. pox	Bullous lesions on helix of ears, forehead, wrists, and hands		
10. S.C.		4–26	Temp.	XXX		3 wks.+		Conjunctivitis during 3rd wk.		Rash in 3rd wk.
11. A.M.	33	4–29	Temp. and sore throat	XXX			Yes, several of the usual		Four other cases in family	Felt weak and tired
12. M.K.	7	5– 1		XXX			Not stated		Sister and a number of classmates	
13. S.B.	8	5– 3	Very mild	XXX					Brother, onset 2 days before	
14 G.S.	10	5– 3		XXX			Measles and rubella		3 other cases in family	All had measles and rubella before
15. ?.C.	8	4– ?	Temp. and sore throat	XXX	Gastro–enteritis	2nd mo. (seen in mo. June)	Measles and rubella		2 other cases in family	
16. Mrs. C.	33	4– ?	Temp. and tiredness	XXX		2nd mo. (seen in mo. June)	Measles and rubella		(Same as above)	Very profuse rash, weak and tired
17. ?.C.	10	4– ?		XXX		Seen in June	Measles and rubella		(Same as above)	Rather mild symptoms

scarlet fever were reported for the area, but in addition 166 cases of erythema infectiosum were reported through the usual channels for the remainder of the month. It was later possible to state that for this same area a total of several hundred cases had occurred and that the total number, including those from adjacent areas in the metropolitan area, would number several thousand.[15] The incidence continued to diminish, however, and with the close of the school year no further cases were reported.

In reviewing the scanty American literature on erythema infectiosum the similarity in the descriptions and observations is in striking agreement with our own.[1-4,7] The prodromal symptoms are usually mild, or they may be missed or absent altogether in many instances. A temperature of 101°-102° F, a mild sore throat, slight coryzal symptoms with occasional conjunctival injection, gastroenteritis, occasionally chills, but more commonly malaise, comprise the variable symptoms and findings that are experienced and observed. The most consistent and by long odds the most characteristic finding is the erythematous eruption encountered (see Table 1). This quite uniformly progresses through three stages or phases. In the first phase a bright erythematous rash appears on the cheeks; circumoral pallor is frequently pronounced. The rash resembles initially that of scarlet fever or erysipelas, except that no edema is manifest as may be observed in the latter condition. It sometimes describes a butterfly pattern crossing the bridge of the nose and extending to the malar eminences bilaterally.

Within one to four days this eruption has extended in most all cases to the extensor surfaces of the arms, thighs, and legs. This is usually an asymptomatic* reticulated macular erythema with the macular characteristics more pronounced at the distal borders. The erythema rarely extends to the dorsum of the hands or feet, being sometimes demarcated rather abruptly just above the wrist and ankle. The thighs and buttocks are variably involved; extension to the neck, upper chest, and trunk may occur with a lesser degree of intensity.

The third stage follows and is characterized by an evanescent occurrence and recurrence of the erythema on previous sites. This phenomenon commonly persists for several days to two weeks. The rash in this stage may entirely disappear for hours or days to reappear at variable intervals for varying durations. This tendency has been noted to extend over several months time in occasional cases[2] and usually follows some stimulus or traumatic experience to the skin, such as friction, rubbing, bathing, temperature changes, or exposure to sunlight. The throat may show slight redness especially of the fauces and in some instances a macular eruption is observed on the fauces, palate, or buccal mucosa.

In a few instances the tongue exhibits a peculiar violaceous or magenta color which is also fleeting in character.[2] Occasionally conjunctival injection has been encountered. Also, cervical lymph glands (including postcervical) may be enlarged[1,2] but one may question if they were not enlarged before the episode. The incubation period is estimated to be from four to 14 days, generally, with up to 20 days or longer as an outside possibility. The communicability would appear to be somewhat less than for measles, but quite comparable to scarlet fever in that it seems to follow a pattern of family or household and other close group associations, such as school rooms and class situations provide. The observed higher incidence was preponderantly in elementary school and preschool-age groups with adolescent and adult involvement somewhat less but quite obviously involved in relation to home and

* Exceptionally, a few cases experience mild pruritic symptoms.

classroom contacts. For instance, it was not unusual to encounter in a household[1,2] as many as five to seven multiple cases, not infrequently including adults, usually the mother. In the instance of one school district six teachers experienced clinical courses while approximately 200 of the student body were so affected. Although the observations were somewhat limited, it would appear that adults[2,12] generally have a somewhat more severe experience with the condition than is usual for the younger subjects. Profuseness of the eruption as well as other subjective symptoms such as dizziness and fatigue seem to be more frequently noted in the older person. Extensive eruptions simulating a purpuric state were observed in a few instances.

While it can be generally regarded as a mild disease entity and rather free of noteworthy complications and sequelae, the persistence of malaise and fatigue was noted in this experience as well as having been mentioned in previous reports.[3,12]

Throat cultures (streptococcal factors were not encountered), blood counts, including differential counts and urinalysis revealed nothing significant, except that the blood picture disclosed an early leucopenic trend, followed by a mild to moderate leucocytosis, suggestive of a viral entity. A moderate eosinophilia was encountered in a limited number of the differential blood studies. This was only suggestive at best, however, and did not exceed 2-3 per cent in the differential picture.*

Attempts to establish the source or focus for this outbreak requires considerable retrospective study. A focal point of origin can be identified with that school district in which the earliest observations were noted and reported. The condition was first considered to be, with about equal frequency, rubella, measles, or scarlet fever since it was only later that the apparently aberrant pattern of behavior became conspicuously prevalent. It was ascertained that the very first cases of this exanthem were encountered between Thanksgiving Day 1956 and the New Year. In this interval one elementary school noted 12 instances of the undiagnosed or unrecognized condition, while with about equal frequency (case for case) a diagnosis of measles, rubella, or scarlet fever was being reported. In a second elementary school six more undiagnosed cases and an equal number of cases that were as variously diagnosed as the foregoing had been encountered.

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* In encountering early cases in an outbreak a differential diagnosis will be essential to rule out the several conditions closely simulated and suggested by the exanthematous manifestations observed:

Rubella: Can best be ruled out through the lack of postcervical lymph gland enlargement as a uniform finding. Such a finding is rare and occasional with erythema infectiosum.

Measles: The prodromata usual for measles are less characteristic or entirely absent in large percentage of these cases.

Scarlet fever: Persistent headache, sore throat, fever more pronounced and uniformly present, earlier leucocytosis and the predilection of sites for the rash with relative infrequency of facial involvement should point up scarlet fever.

Erythema multiform: Rare in children, redness of cheeks absent, relatively more frequent involvement on the dorsum of the hands and feet, absence of undue or epidemic prevalence in the community.[2]

Toxic erythema: Duration is shorter and a lessened tendency to recur will be apparent, also an absence of epidemic or undue prevalence.

Exanthema subitum: Higher initial and sustained fever, gastroenteric involvement with vomiting and diarrhea and slight coryzal findings more uniformly encountered. Leukopenia is more pronounced with a relative lymphocytosis. The exanthema follows the subsidence of the temperature. Infants and children under two years are involved.

Boston exanthema: Early temperature, 101°-104° F not uncommon, burning and pain in the eyes. In adults especially initial chills, headache, and muscle aches and pains are quite commonly encountered.[8,9] This is uniformly more pronounced than in erythema infectiosum. The unusual facial involvement and the evanescence of the rash encountered in erythema infectiosum are not characteristic for this condition.

A sibling of one of these earliest public school victims who attended a parochial school located in the community had an onset of the unusual eruption several days prior to the occurrence of any observed cases in the public schools of that district. It was subsequently learned that approximately 75 per cent of the children representing about 60 per cent of the families making up the enrollment of this parochial school had experienced the rash in November and early December. Little if any significant illness accompanied the experience or was noted. Due to a temporary vacancy on the staff, this parochial school for a period embracing the interval concerned was not covered by the public health nursing service. Thus routine observations that might have led to earlier awareness and recognition of the condition were not in effect.

In reporting on an outbreak of erythema infectiosum in Cuyahoga County, Ohio, in 1951, Freeble and Carlson[1] mention that the outbreak was limited to an area of which the population contained as high as 25 per cent recently displaced people from Central Europe. It was observed in this Oakland County situation that the family having one child attending each of the two school systems (parochial as well as public) were neighbors to a family recently displaced following the Hungarian uprising of October, 1956. Although a child of school age lived in this refugee family household, she had not been enrolled in school previous to the incident. No definite history of any recent exanthematous eruptions effecting this child or two younger siblings of preschool age could be elicited.

Discussion

The epidemic occurrence of an unusual and generally unfamiliar communicable disease, such as erythema infectiosum represents, presents a problem to the community. It will devolve on the state and local health authorities to make some recommendations as to appropriate policies for such control measures as the situation warrants. In several instances where this condition was encountered elsewhere no specific control measures such as isolation were taken nor thought to be necessary once the condition had been definitely recognized and differentiated. It is true, however, that these were, in practically all instances, small circumscribed outbreaks usually in somewhat more isolated communities or in smaller school populations and were a matter of history in several instances before the identity or unusual nature of the disease were appreciated. It has been stated that when encountered in Austria no rigid isolation measures are enforced because of the accepted opinion that the disease is relatively innocuous as far as the severity of its course or the sequelae are concerned.

Of course, it will require a rather exacting degree of early surveillance and observation to rule out the possibilities that other exanthems, generally recognized as more significant and thus requiring control measures, are not involved. It would entail both early and continuing observations to establish the fact that erythema infectiosum is the only one of these conditions that is present in the community. Mention is made in most of the foregoing reports that other exanthems did occur simultaneously. Whether these observations and conclusions were in some measure due to the understandable degree of confusion and error in the diagnosis of the individual cases first seen by various school, health, and medical attendants deserve consideration and should not be lost sight of. It seems to us that it would be unusual not to have some divergence of opinion with regard to the earliest case or cases encountered. To us this appears to be the "core" of the

problem. Is it possible to be "on our toes" to the degree and extent that we can recommend no control through isolation in a populous area? Can we be sure an effectively continuous screening service will not break down through lack of observation and control, allowing other exanthematous conditions such as scarlet fever to enter the scene and gain substantial prevalence before being recognized? The philosophy which prompted us to adopt the policy of excluding all the exanthems, including erythema infectiosum for one week as a minimum, had for its justification the possibilities for such errors. We were simultaneously receiving reports on the occurrence of other exanthems in proportions beyond our abilities to do an effective job of screening and differentiating. Therefore, we are in agreement with Zuckerman[11] who believes it well, in populous areas at least, to exclude the actual case from school. The contacts however need not be excluded.

Although it appears that the occurrence of erythema infectiosum may not have in general any far-reaching repercussions as far as a significant number of serious complications or sequela are concerned, it does appear in our recent experiences to have had occasional but perhaps noteworthy instances in which cases may result or terminate unfavorably. In one instance a child was seen at an outpatient clinic presenting an erythematous but at the time not identifiable condition which was regarded as being subacute and recurrent in character. The condition was tentatively diagnosed as "possible allergy." On the same occasion a sibling presented certain acute symptoms simulating the prodromata of a possible acute communicable disease. No rash was as yet apparent in this later case.

Within an interval of five days the child originally presenting the rash suddenly became alarmingly ill at home during the early morning hours and died enroute to the hospital. No post mortem was done; death was attributed to "measles complicated by pneumonia." Also, as has been mentioned in the foregoing, an occasional case—usually in the older-age group—will experience an erythema which is profuse and apparently purpuric in character and extent. Whether these few exceptions among hundreds of cases portend any possible trends toward stepped-up virulence under conditions of high prevalence can only be speculated upon at this time. It might be well to consider suspending final opinion as to the significance and potentials of the disease and to withhold our decisions to forego all control measures until we have had the benefit of further experience and opinion in the matter.

Summary

Since laboratory facilities were not available in this immediate area, no attempt was made to isolate a viral causative agent on this occasion, although admittedly the procedure is now recognized to be quite feasible under favorable circumstances. Enders, et al.,[8,14] have recently demonstrated the relative simplicity of the tissue culture method. Also the in vivo test tube, "cytopathic" method may be relied on to demonstrate the persistence of a specific virus. Recent success in isolating the measles virus suggests that the virus for this exanthem may be as readily identifiable.[8,14] Indeed, a recent account by Warner and associates[14] reports that virus isolates were identified in three instances among 67 cases of erythema infectiosum occurring at Reading, Pa., in 1955. Also another identical isolate was identified in 1956 from a case encountered in a small epidemic in southeastern Pennsylvania. According to Warner the "cytopathic effect" of these isolates resembles in many respects that of the measles virus. These isolates were obtained after a series of three to five

blind passages in monkey kidney tissue.

The Boston exanthem, an entity that closely simulates erythema infectiosum and which may easily be confused with the same, has been demonstrated likewise as having a specific viral causative agent.[8] Isolates have been reported by Neva in a recent (1954) outbreak in Pittsburgh.[8,9] This isolation has been reported as identical to the one made earlier by Enders and co-workers during the Massachusetts outbreak in 1951 of an exanthematous condition previously unknown or unrecognized but now identified as the Boston exanthem.

Sprunt[9] refers to current successes in the isolation of previously unidentified viral agents causing the various disease entities as being somewhat chaotic. Particular mention is made concerning the rapidly moving developments in this area of research and she assumes that under the circumstances simultaneous isolations of the same virus may be made at widely separated points by different workers. The continuing of reports in the literature provide a meeting and sorting place wherein perhaps in due time the seemingly numerous identifications will "fall into a more distinct pattern." It is conceivable perhaps that some of these isolates as reported on individually at present may prove to be identical or closely related to others of a group when final evaluation and classification will have been accomplished.

Conclusions

1. Erythema infectiosum is a distinct exanthem heretofore infrequently encountered or recognized in this country.

2. It appears in general to be mild to moderate in the severity of its clinical manifestations, rarely resulting in significant complications or sequela.

3. It simulates, sometimes rather closely, several of the more commonly encountered exanthems with which it may be readily confused.

4. It is important from the standpoint of the community health to differentiate and recognize the condition as opposed to certain other exanthems usually regarded as having significant community public health importance and recognized as justifying minimal control measures at least.

5. An epidemic of erythema infectiosum occurred in the southeast Oakland County and other adjacent communities of the Detroit metropolitan area. Observations and reports would indicate that several thousand cases occurred from late November, 1956, throughout the succeeding months of 1957 until the closing of the school year in June.

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Journal of Public Health

EDITORIALS

Why Do They Behave Like Human Beings?

Health workers agree generally that we are now in a period when the human factor must be taken into account if public health is to handle its problems successfully. Many of the areas of health with which public health is today concerned involve individual voluntary action on the part of many people. There is also an increasing awareness that attitudes, beliefs, motives affect the willingness and readiness of people to take voluntary action with respect to their own health or that of members of their families. This problem has been studied and discussed in connection with decisions to take x-rays and more recently in relation to polio immunization. Similar questions arise in relation to the use of medical facilities, child rearing, the problem of smoking, accidents, and numerous others.

A central question of public health has become: Why do people behave as they do? Why do they behave like human beings? And for answers to this question public health workers are turning increasingly to those sciences whose central concern is human behavior and the conditions that affect and determine it—the social sciences. Some areas of social science investigation—communication, opinion and attitude research, group processes, differing ethnic needs and situations—have already impinged directly on public health. Undoubtedly, others will do so in the future. For this reason the bookshelf article in this issue deals with social science and public health. It is intended as a cross-sectional view of the relations between these two fields, which should enable the public health worker to get a picture of what is happening at the moment, and should help him pursue the subject further if that is desired.

Vaccination Against Poliomyelitis

Recently, Surgeon General Leroy E. Burney pointed out that in 1958 there was more paralytic poliomyelitis than in 1957. More than half the paralytic cases occurred in children under five years of age. Furthermore, despite the high susceptibility of preschool children, about a third have not had any poliomyelitis vaccine. And this has happened despite the fact that there is available an effective vaccine, which when properly employed provides a high degree of protection.

Why does this situation exist? And what can be done about it? A whole series of studies have demonstrated that many of the unvaccinated are in social groups of the community not easily accessible to the use of mass means of communication employed by health agencies. In some cases, the reasons may be economic, but other factors have an equally significant or even more important effect. Amount of education, for example, is an extremely relevant factor. In short, what emerges as one examines the situation, is the need for a different approach, a different point of view in tackling the problem this year.

The unvaccinated can be reached only at the local level, and this means a coordinated attack by local groups. The local health agency must with the aid of other community groups undertake an aggressive campaign of informal communication. It has been found that personal contacts, face-to-face communication, are more effective in reaching the groups that are not reached by mass media. Furthermore, questions of accessibility must be taken into account. Is it easy to get to a clinic or other facility to be vaccinated? Such elements do play an important part and cannot be overlooked. Ingenuity and determination can devise methods for reaching those who need to be vaccinated. The question is: Do we want to have as many people vaccinated as possible? If we do, the time for action is now!

Theobald Smith, M.D. (1859-1934)

WHEN the International Congress of Microbiology met in New York in 1939, the medal issued to commemorate the occasion bore the profile of Theobald Smith, America's foremost scientist in this field. Recognition of Smith's eminence was not limited, however, to the world of science. Four years before his death, on November 30, 1931, "Time" described him as the "patriarch of pathology." This reputation, based on numerous contributions to the understanding and control of disease, some of them of fundamental importance, had grown over a period of almost fifty years. Winslow related that when he was beginning his career, it was already "a somewhat rueful jest in the laboratory that if you had a new idea you always found that Theobald Smith had had it first."

This year marks the centenary of his birth, and provides an appropriate occasion for a review of his contributions to public health. Theobald Smith's most important work was his investigation of the cause and prevention of Texas cattle fever. He had started this study in 1884 when he became director of the pathological laboratory of the U. S. Bureau of Animal Industry. Smith had been recommended to Dr. Salmon, head of the bureau, by Professor Gage of Cornell, with the comment that "he was a born researcher, with a keenness of insight that promised great things." This prediction was to be fulfilled in 1893, with the publication of the classic study, written together with F. L. Kilborne, "Investigations into the Nature, Causation and Prevention of Southern Cattle Fever." In his preliminary report on Texas fever, presented before the American Public Health Association in 1889, he opened up the problem of the secondary host, and predicted that the solution of the Texas fever problem would "throw a strong light on human malarial diseases." "It took four years of slavery at the microscope, at autopsy, at watching ticks hatch from the egg," wrote Smith, but after 1893 the animal carrier could no longer be overlooked. And in the next few years this type of transmission was demonstrated in malaria, plague, yellow fever, and other important communicable diseases.

Immediately after the solution of the Texas fever problem, Theobald Smith began his studies on the tubercle bacil-

lus. In 1898, based on a series of rigorous experiments, he published his conclusions differentiating the human and bovine forms of the tubercle bacillus, and showing that man may be affected by bovine tuberculosis. Furthermore, while engaged on the problem of Texas cattle fever, he had produced in 1886 a basic contribution entitled, "On a New Method of Producing Immunity from Contagious Diseases," which laid the foundation for the development of means of immunization in diphtheria and tetanus.

In the course of his long and active career, Smith made many other contributions to microbiology. Indeed, his bibliography comprises 224 items. Obviously these cannot be reviewed, yet one cannot omit mention of the last of his numerous publications, "Parasitism and Disease," a masterly summation of the ecological viewpoint in the study of disease.

From 1895 until 1915, Theobald Smith was a member of the Massachusetts State Board of Health and of the faculty of Harvard University. From 1901 until his death, he was associated with the Rockefeller Institute for Medical Research. In 1915, he became director of the Department of Animal Diseases of the Rockefeller Institute at Princeton, a position which he held until 1929.

In appearance and personality, Smith was the typical scientist, accurate and meticulous to a high degree, precise in his manner, and completely absorbed in his work. Indeed, Winslow says that "he forgot to appear for an honorary degree to have been awarded by one of America's most distinguished universities." But he had something even more important, he had the rare quality of honesty that avoids self-deception. With this quality of character and with his force of intellect, Theobald Smith was able to change ideas on the nature and transmission of communicable diseases, and to become a benefactor of mankind.

Radiation Protection Commission

New Jersey has a Radiation Protection Commission created by the 1958 Legislature. According to the act the seven-member commission is made up of the commissioners of health and labor and industry or their representatives and five members appointed by the governor. At an organization meeting in October, Frank G. Dunnington, Ph.D., professor of physics, Rutgers University, was elected chairman.

The commission has power to promulgate, after public hearing, codes, rules, and regulations to prevent unnecessary radiation. The State Department of Health, which has already had a radiological health program for a number of years, will enforce the rules and regulations.

ASSOCIATION NEWS

EIGHTY-SEVENTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
ATLANTIC CITY, N. J.—OCTOBER 19–23, 1959

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. The purpose of Fellowship is to recognize in each field a superior professional stature and performance. Criteria for selecting the individual are by comparison within his own public health specialty. As of January 1, 1959, the total membership of the Association was 12,591, including 3,381 Fellows, or 27.5 per cent of the total.

Questions are frequently asked regarding the requirements for Fellowship and the following statement outlines the provisions of the current By-Laws governing qualification and election.

Professional public health workers who have been members of the Association for at least two years, and who are of established professional standing in the field of public health, either employed by public or private organizations, or in independent private practice, are eligible for election as Fellows, upon their own initiative or upon invitation issued by the Council of the Section with which they are affiliated, or by the Executive Board acting in place of the Section Council when they are not affiliated with a Section. Persons in the following categories are considered to have an established professional standing in public health for this purpose:

(a) A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health or other equivalent degrees, according to standards approved by the Executive Board.

(b) A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

(c) A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

(d) A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

(e) A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs (b) and (d) that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

(f) A person not covered by the above, who has made substantial contributions to public

health work in his chosen branch and who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Applications are accepted up to August 1 each year for consideration by the Governing Council at the fall meeting. It is important to make clear that members themselves should take the initiative in submitting such application. Although several thousand persons have been elected to Fellowship since 1922, there are other persons well qualified who have never initiated the process. Members should not await action by others if they wish to attain Fellowship. It is proper for them to take the first step.

An application for Fellowship must include the names of five references, at least two of whom are Fellows of the Section with which affiliation is desired. The APHA office will assist, on request, in determining the Section with which prospective references are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship should include the names of any two Fellows of the Association among the five references.

When properly completed, the application is sent to the APHA office. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 14 Sections, plus a chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-Laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or of one of the Sections, chairman of an Association or Section Committee (over one hundred in number), or of the Technical Development Board, a member of one of the seven Standing Committees, a member of the Governing Council or Executive Board. Some Civil Service and merit system records depend upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $20 annually and include a subscription to the American Journal of Public Health and other services to which members are eligible. Life membership is available at $200 covering all future annual dues.

Applications for Fellowship to be considered at the 87th Annual Meeting in Atlantic City, N. J., October 19-23, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information address the Membership Department, American Public Health Association.

87th ANNUAL MEETING
HOW TO MAKE HOTEL AND MOTEL RESERVATIONS FOR THE ATLANTIC CITY MEETING

A HOUSING BUREAU will be operated by the Atlantic City Convention Bureau. Since all requests for rooms will be handled in chronological order, you are urged to send in your reservation as quickly as possible. (Map showing location of hotels and motels and reservation form appear on page 542.)

HOTELS AND RATES*

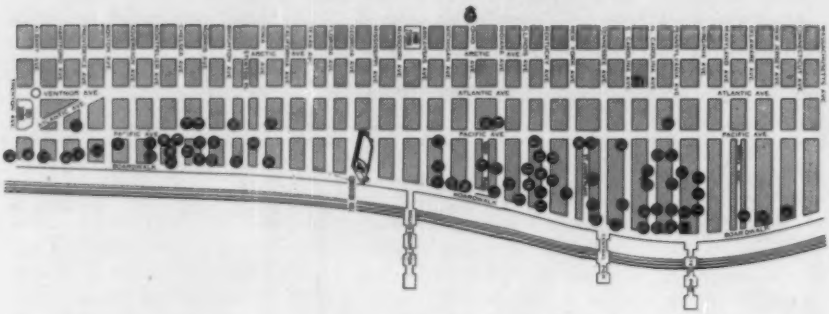
Map No.	Hotels	Rooms with Bath Single	Rooms with Bath Double	Two Rooms—One Bath 2 Persons	Two Rooms—One Bath 3 Persons
10	Abbey	$7.00– 8.00	$8.00–12.00		
57	†Ambassador	8.00–18.00	10.00–22.00	$20.00	
1	Breakers	4.00– 7.00	7.00–18.00	8.00	$13.00–20.00
20	Carolina Crest	6.00– 7.00	8.00–11.00		
16	Chalfonte		10.00–17.00		22.00
43	†Claridge	9.00–15.00	13.00–19.00		
13	Colton Manor		12.00–16.00		15.00
29	Columbus		8.00		
44	Crillon	10.00	11.00–12.00		
50	†Dennis	7.00–11.00	10.00–24.00	20.00	20.00
46	Eastbourne	6.00– 8.00	9.00–11.00	14.00	16.00
28	Flanders	7.00– 8.00	9.00–12.00	12.00	15.00
9	Holmhurst	5.50	8.00	10.00	12.00
36	Jefferson	7.00	9.00–10.00		
37	Kentucky		7.00– 8.00		12.00
18	†Lafayette	10.00	12.00	16.00	18.00
40	†Madison	6.00– 8.00	8.00–14.00		12.00–16.00
67	Mark	5.00– 7.00	6.00–10.00		
48	†Marlborough–Blenheim	9.00–11.00	12.00–20.00	15.00–18.00	18.00–21.00
26	Mayflower	6.00– 8.00	8.00–14.00		
32	Monticello	5.00	7.00	10.00	12.00
4	Morton	6.00– 8.00	9.00–12.00		
25	New Belmont	4.00– 5.00	6.00–10.00		13.00
24	New Drake	6.00	7.00–10.00	12.00	14.00
64	Old English		10.00–12.00		
22	†Penn-Atlantic	4.00	7.00		11.00
77	†President	7.00–12.00	10.00–20.00		
33	Richfield–Boscobel	4.00– 6.00	6.00– 8.00		
47	Runnymede		7.00–10.00		
2	St. Charles	10.00	12.00–14.00		
7	†Seaside	7.00–10.00	10.00–18.00		21.00
23	†Senator	8.00–14.00	12.00–18.00	16.00–20.00	20.00–24.00
51	†Shelburne	8.00–22.00	10.00–22.00		21.00–27.00
54	†Sheraton Ritz–Carlton	8.00–10.00	10.00–20.00		
35	Sterling	5.00– 6.00	8.00–10.00	9.00–10.00	12.00

* The above rates are subject to 3% Municipal Tax. † Suites available.
Some Hotels and Motels may require a deposit.

MOTELS AND RATES*

Map No.	Motels	Rooms with Bath Single	Rooms with Bath Double	Map No.	Motels	Rooms with Bath Single	Rooms with Bath Double
60	Algiers		$10.00–12.00	27	Mayflower		8.00–14.00
12	Aristocrat		10.00–18.00	76	Monte Carlo Beach	6.00	10.00
63	Baronet		8.00	14	Monterey		10.00–12.00
21	Carolina Crest		10.00–14.00	75	Nautilus		10.00–12.00
62	Castle Roc		12.00–16.00	3	Ocean View		6.00–10.00
39	Continental		10.00–14.00	78	President		12.00–20.00
17	Coronet	$10.00	12.00–16.00	49	River Edge		8.00
56	Diplomat		10.00–14.00	11	Sahara	8.00	10.00–12.00
58	Dunes	8.00–10.00	12.00–16.00	5	St. Morits		10.00–12.00
45	Eastbourne		12.00–16.00	53	Saxony		12.00–14.00
55	Eldorado		12.00–14.00	68	Sea Isle	6.00	8.00–12.00
52	Empress	10.00	10.00–22.00	8	Seaside	10.00	12.00–16.00
30	Envoy	7.00– 9.00	8.00–12.00	71	Seville	10.00	12.00–16.00
69	John's	6.00	8.00–12.00	38	Sorrento	8.00–10.00	12.00–16.00
66	†LaConcha	12.00	12.00–16.00	73	Strand of Atlantic City	6.00– 9.00	9.00–12.00
34	Lombardy		10.00–18.00	74	†Sun 'n Sand		12.00
70	Malibu	8.00	10.00–16.00	19	Tides	10.00	12.00–14.00
61	†Mardi Gras	10.00	10.00–14.00	72	Tropicana		10.00–12.00
65	Martinique		10.00–12.00				

Street Plan of Atlantic City Showing Location of Convention Hall and Housing Bureau Hotels and Motels



APHA HOTEL/MOTEL RESERVATION FORM

MAIL TO:

Housing Bureau
16 Central Pier
Atlantic City, N. J.

.....1959
(Date)

Please make the following reservation:

Hotel.....First Choice

Hotel.....Second Choice

Hotel.....Third Choice

..... Single Room/bath for ..... person(s). Rate $..... to $..... per room

..... Double Bedroom/bath for ..... person(s). Rate $..... to $..... per room

..... Two Rooms/1 bath for..... person(s). Rate $..... to $..... per room

Single rooms are limited; please arrange for sharing twin-bedroom if possible

Arrival..... 1959

Departure..... 1959

The names and addresses of all persons who will occupy the room(s) requested must be listed. Please be sure to indicate arrival and departure hours and dates. If you wish to cancel or make any change in your reservation, write to the Housing Bureau, and **NOT** the hotel to which you were assigned.

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Name of Applicant.....

Street..... City..... Zone..... State.....

Note: You will receive confirmation direct from the hotel.

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

SOCIETY AND SECRETARY

ALABAMA PUBLIC HEALTH ASSOCIATION, Norma L. Chandler, State Health Dept., Montgomery
ARIZONA PUBLIC HEALTH ASSOCIATION, Mrs. Verona Massey, State Dept. of Health, Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN PUBLIC HEALTH ASSOCIATION, Ruth Bishop, 225-37th Ave., San Mateo
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Dorothea Hansen, City Health Dept., Los Angeles 12, Calif.
COLORADO PUBLIC HEALTH ASSOCIATION, Alice de Bruyn Kops, 4660 S. Delaware, Englewood
CONNECTICUT PUBLIC HEALTH ASSOCIATION, E. Louise Ratcliff, M.P.H., 364 Whitney Ave., New Haven 11
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 511 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Nathan J. Schneider, Ph.D., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Carl Fox, 33 Pryor St., N.E., Atlanta
HAWAII PUBLIC HEALTH ASSOCIATION, Alison MacBride, R.N., 510 S. Beretania St., Honolulu 13
IDAHO PUBLIC HEALTH ASSOCIATION, Wesley O. Young, D.M.D., P. O. Box 640, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Gale E. Coons, State Board of Health, Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Mary L. Wombacher, State Dept. of Health, Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, Evelyn Ford, State Board of Health, State Office Bldg., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Mrs. Mary Ann Rhodes, 620 S. Third St., Louisville 2
LOUISIANA PUBLIC HEALTH ASSOCIATION, Andrew Hedmeg, M.D., State Dept. of Health, New Orleans 7
MARYLAND PUBLIC HEALTH ASSOCIATION, Lillian B. Davis, Sc.D., Department of Education, Baltimore
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Maurice J. Mayer, 405 Hollister Bldg., Lansing
MINNESOTA PUBLIC HEALTH CONFERENCE, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Thomas S. Willett, Montana Public Health District I, Hardin.
NEBRASKA PUBLIC HEALTH ASSOCIATION, Emily Brickley, 1004 Capitol Bldg., Lincoln
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Daniel T. Marley, P. O. Box 8066, Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Allan Mariowe, 295 Flatbush Ave., Brooklyn 1
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mrs. Kathleen Boland, Rensselaer County Health Dept., Troy
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, R. W. Brown, Bucombe County Health Dept., Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Jean E. Norton, R.N., Box 133, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Virginia Jones, Ohio Dept. of Health, Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, 2400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Russell E. Lee, P. O. Box 231, Portland 7
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Lusia L. Trinidad, Santurce
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Laura M. DeMarse, State Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Mrs. Virginia Cole, City Health Dept., 115 S. State St., Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, William A. Dorsey, P. O. Box 2088, Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Tom Drummey, State Dept. of Health, Smith Tower, Seattle
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Paul B. Shanks, State Health Dept., Charleston
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, 1 W. Wilson St., Madison
MIDDLE STATES BRANCH, APHA, Thelma Luther, Dept. of Health, Des Moines, Iowa
SOUTHERN BRANCH, APHA, Betty Ficquett, State Board of Health, Columbia, S.C.
WESTERN BRANCH, APHA, Robert E. Mytinger, 760 Market St., San Francisco 2, Calif.

Nebraska Uses Home Talent

Program participants of the eighth annual and second meeting after affiliation of the Nebraska Public Health Association were, with five exceptions, Nebraska public health practitioners and other citizens. The keynote address, "Group Dedication to Public Health" at the first general session was given by J. S. Felton, M.D., professor of preventive medicine, the Los Angeles Medical Center of the University of California. As a luncheon speaker he discussed "Current Interest in Occupational Medicine."

Another general session was devoted to three current problems—hospital staphylococcal infections, poison control programs, and radiological health. A third was a panel on "Public Health as it Relates to Everyday Mental Health Casualties," with a nurse, sanitarian, social worker, and health educator as participants.

The banquet speaker was A. Stanley Trickett, Ph.D., head of the Department of History in the University of Omaha,

on "Behind the International Headlines." On this occasion also the society's annual award was given to Leeta Holdrege, R.N., recently retired executive director of the Omaha Visiting Nurse Association, in recognition of her outstanding contribution to the progress of public health in Nebraska.

Each of five sections met for a half day. The Health Education Section heard from the resource development agent of the agricultural extension service in Sherman County about present progress in the Rural Development Program of that county. This is the single Nebraskan county among 63 counties and eight trade areas in 30 states in which rural development programs are being carried on. (See A.J.P.H. 47, 8: 1046, and 48, 6:830.) In studying the resources of the county, it was found that the average size of farms in the county is about one-third too small to give families on them "a satisfactory level of living and at the same time make financial progress."

Helen Becker, health education specialist of the state university's agricultural extension service, was succeeded in the presidency by John Thompson, Ph.D., director of health, physical education, and safety, in the Lincoln Public Schools. Other new officers are:

President-Elect: Violet Dubois, health educator, Omaha-Douglas County Health Dept.
Vice-President: Victor Levine, M.D., Ph.D., Creighton University, Omaha
Secretary: Emily Brickley, R.N., Nursing Division, State Department of Health
Treasurer: J. S. Olewine, sanitary engineer, Omaha-Douglas County Health Dept.
Representative, APHA Governing Council: E. D. Lyman, M.D., health officer, Omaha-Douglas County.

Upholding the State Commissioner

The Committee on Public Health of the Massachusetts Legislature recently heard testimony on a bill authorizing the appointment of an associate commissioner of public health. At this hearing Dean Clark, M.D., executive director of the Massachusetts General Hospital, represented the Massachusetts Public Health Association and the state's hospital association. He told the committee that appointment of a deputy was "absolutely essential" to proper administration of the department. He further recommended raising the commissioner's annual salary from $14,000 to $18,000. The bill as written authorizes an increase to $15,000.

Other groups speaking for the new position, originally recommended by the Massachusetts Hoover Commission, were the Law-Medicine Institute of Boston University and the Massachusetts Medical Society. The commissioner himself, Alfred Frechette, M.D., reported that the associate commissionership had been sponsored by the Governor's Committee of Deans of Medical Schools, which had aided the governor in seeking a new commissioner.

Defining Social Health

The winter meeting of the public Health Association of Northern California was held in West Sacramento on January 30. "Social Health—What's That?" was the question to which the participants addressed themselves in four separate group sessions. These dealt with the social diseases of addiction, delinquency, mental discord, and the "lost child."

Keynoters for the discussions were Gregory Bateson, cultural anthropologist of the VA Hospital in Palo Alto; Jessie Bierman, M.D., professor of maternal and child health, University of California School of Public Health; and Jack W. Wedermeyer, newly appointed director, California Department of Public Welfare.

The discussions were "pulled together" by the newly elected attorney general of the state, the Honorable Stanley J. Mosk, at an evening meeting. In "Leg-

islative Implications of Social Ills" he reviewed the state's notable public health programs in the field of social illness, using alcoholism and drug addiction as examples. The report of the meeting modestly says "it will probably take at least one more meeting" to help all those who are sick, even though they may show no physical or mental disorder.

Because of the hospitalization of the president, Dalrie Lichtenstiger, following an automobile accident, her resignation was regretfully accepted. William D. Simmons, supervisor of the prevention of blindness program, State Department of Health, was elected interim president. Greetings from the American Public Health Association were sent by President Leona Baumgartner, M.D., and Executive Director Berwyn F. Mattison, M.D.

Full Meeting in Spite of Downpour

The Oregon Public Health Association met in Portland on October 6 and 7. "In spite of the constant downpour during the entire meeting" the Public Health Newsletter reports that 317 attended the meeting. This is approximately the total number of members at that time (by February there were 354). Attendance even held up during the second afternoon, reportedly.

The theme of the meeting was "Health and Social Service—Catalysts in a Free Society." The keynote address was given by Victor I. Howery, Ph.D., dean of the University of Washington School of Social Work. His address was titled "Do Public Health Services Relieve People of Individual Responsibilities?" "The real goal of all the services, health, welfare, recreation, and other services," he said, "is to help an individual develop capacity for depending upon himself to the degree that is appropriate within our interdependent society."

The Annual Award for Outstanding Service was made to F. Sydney Hansen, M.D., M.P.H., for "leadership and achievement in the development of progressive public health practice." Dr. Hansen has been health officer of Multnomah County for 20 years and is past-president of the Oregon Tuberculosis and Health Association and of the Oregon Health Officers Association. The presentation was made by Curtiss M. Everts, Jr., state sanitary engineer, winner of the 1957 award.

James H. Stewart, M.D., medical consultant, State Public Welfare Commission, was chairman of the program committee. A. Erin Merkel, M.D., M.P.H., health officer of Jackson County was the outgoing president. New officers are:

President: Harold T. Osterud, M.D., M.P.H., health officer, Lane County
President-Elect: Gatlin R. Brandon, M.P.H., director, Public Health Laboratory, State Board of Health
Vice-President: Eleanor B. Gutman, M.D., director, Vision Conservation Section, State Board of Health
Secretary: Russell E. Lee
Treasurer: John Graham
Representative, APHA Governing Council: Clair V. Langton, Dr.Ph., D.Ed., director, Division of Health and Physical Education, Oregon State College.

APHA membership blank on page XXXIX

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Deputy Health Officer—for population of 630,000, with teaching responsibility in medical college. Combined beginning salary $11,000. Eligibility for license in Alabama and eligibility for certification by Board of Preventive Medicine required. Apply to Health Officer, Jefferson County Department of Health, P. O. Box 2591, Birmingham 2, Ala.

San Diego County is recruiting public health physicians with administrative experience in maternal and child health for **Chief, Bureau of Maternal and Child Health** position in department of public health. Salary $954-$1,052 monthly (10 per cent higher if Board certified). For details, write San Diego County Personnel Department, Room 403 Civic Center, San Diego, Calif.

Two Physician Vacancies—Connecticut State Department of Health. Examples of duties: (1) to consult with maternity hospitals regarding improvements in care of maternity patients and newborn infants and procedures; work with committees of the state medical society; follow up maternal deaths by interviewing physicians and checking hospital records; plan and organize institutes on maternity and newborn for physicians and nurses; (2) to be in charge of program for coordinated medical and social care for illegitimately pregnant mothers and babies born out of wedlock. Positions require completion of general internship in AMA approved hospital and not less than two years' employment in pediatrics or obstetrics or completion of two-year internship in pediatrics or obstetrics in approved hospital and master of public health degree. Also, eligibility for license to practice medicine and surgery in Connecticut. Reply to George J. Walker, Personnel Director, State Office Bldg., Hartford 15, Conn.

Hospital and Medical Care Director—Salary $11,196 per year. Five years' administrative work experience in hospital management or in a medical services agency of which two years shall have included responsibility for the administration and policy formulation of a medical service program, graduation from a medical school of recognized standing, including or supplemented by one year of internship in a recognized general hospital, and one year of graduate work in hospital administration or public health. Eligibility for a license to practice medicine in the Territory of Hawaii. For application and information, write to Territory of Hawaii, Department of Civil Service, 825 Mililani St., Honolulu 13, Hawaii.

Medical Health Officer—for established rural county health department in central Illinois. Good personnel policies with vacation and retirement. Salary range $9,600-$12,000 for physician with public health training and experience. Contact W. T. Douglas, M.D., Hillsboro, Ill.

Medical Health Officer—for Springfield, Mass. (population 170,000). Modern public health program, including school health services. Staff: 56 full-time and 34 part-time employees. Excellent personnel policies. Qualifications: M.D. and experience in public health required; M.P.H. desirable. Salary open. Apply to John C. Ayres, M.D., 1414 State St., Springfield, Mass.

Medical Health Officer (Grade I)—for Cortland County Health Department (population 40,000); offices in city of Cortland, county seat. Salary starts at $14,000 per year; car furnished. Established in 1928, the health unit has a well trained staff of nurses and sanitarians, and a part-time sanitary engineer. Address inquiries to Dr. S. A. VerNooy, President, Board of Health, 84½ Main St., Cortland, N. Y.

School Physician—Full time; New York State medical license or eligibility required. Pediatric background and M.P.H. degree desired. Responsible, in conjunction with another full-time physician, for school health services to 8,000-9,000 children. Staff of eight nurses, five dental hygienists. Salary $10,000-$12,000, depending on experience; retirement plan,

Social Security, vacation, sick leave. Write Elwin S. Shoemaker, Executive Officer, Board of Cooperative Education Services, Box 43, Yorkville, N. Y.

Health Officer—Coos County, Ore., situated in southwest part of state bordering ocean. Excellent fishing and hunting. Salary $13,500-$14,500, depending on qualifications. Must have M.P.H. degree, some health department experience, and be eligible for licensure in Oregon. Position under merit system; Social Security supplemented by state retirement. Write to the Hon. James W. Harrison, Judge, Coos County, Court House, Coquille, Ore., or Mr. Alfred T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

Health Officer—for Douglas County, with headquarters at Roseburg, Ore. $12,960 to start. M.D., plus M.P.H., and some experience. Must be eligible for licensure in Oregon. Social Security and state retirement coverage. Write to Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

Public Health Director—Full time, for a staff of 14. City of 45,000. Must be eligible for Wisconsin physician license. Salary range $10,327.20-$12,240.80 yearly. Car allowance, paid vacation, sick leave, and retirement benefits. Write Civil Service Commission, Sheboygan, Wis.

Director, Local Health Services—Wisconsin. Work with the state health officer and professional staff in improvement of local health services. M.P.H. degree and eligibility for license to practice medicine in Wisconsin required. Salary $10,464-$14,484, commensurate with experience. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Director, Nursing Education—Jefferson County Health Department. Salary $4,812-$5,844. B.S. degree in public health nursing and experience as nursing supervisor required. Forty-hour week, Social Security, and retirement benefits; staff of 55 nurses. Apply to Health Officer, Jefferson County Health Department, P. O. Box 2591, Birmingham, Ala.

Director, Assistant Director of Psychiatric Nursing Services, and Mental Health Nursing Consultant—for a new, developing service, in the newest state. Minimum qualifications for Director position: graduate level preparation in psychiatric nursing, four years of experience, two years of which shall have been supervisory or administrative experience. Salary $9,000-$10,800. For Assistant Director of Psychiatric Nursing Services: graduate level preparation in psychiatric nursing and three years of experience, one year of which shall have been in a supervisory capacity. Salary $7,200-$8,400. Mental Health Nursing Consultant: graduate level preparation for public health nursing program and one year in a teaching or supervisory position. Salary $7,200-$8,400. A cost of living differential is allowed based on the area of assignment. Application obtainable from Helen Hartigan, Chief, Section of Nursing, Alaska Department of Health, Juneau, Alaska.

Tuberculosis Nursing Consultant—to carry out a program of consultation and education in tuberculosis nursing. Minimum qualifications: an A.B. or B.S. degree, preparation for public health nursing, advanced study or experience in tuberculosis nursing, and two years of experience in a generalized public health nursing program, which may include one year in a supervisory or teaching capacity. Salary $6,360-$7,560. Applications obtainable from Helen Hartigan, Chief, Section of Nursing, Alaska Department of Health, Juneau, Alaska.

Director of Public Health Nursing—County Health Department. Master's degree and three years of public health nursing, one supervisory or administrative. $478-$581. Liberal fringe benefits. Santa Cruz County Personnel Department, 105 Soquel Ave., Santa Cruz, Calif.

Public Health Nurses—with beginning salaries of $4,160, $4,550, $4,888, depending on qualifications, with merit increases, longevity rates, liberal sick leave and retirement benefits. New air-conditioned building. Contact Flint Civil Service Commission, Municipal Center, Flint 2, Mich.

Public Health Nurses ($335-$455) and **Graduate Nurses** ($275-$395)—for generalized public health nursing in New Mexico Department of Public Health. Opportunities for advancement, retirement plan, and other fringe benefits. Write Merit System Supervisor, Box 939, Santa Fe, N. M.

Public Health Nurse—for immediate appointment in urban and rural areas of Dutchess County, located about 75 miles north of New York City. Annual salary $3,960-$5,020; maximum reached in five years. Cars provided. Excellent personnel policies. Apply Director of Nurses, Margaret Wells, 236 Main St., Poughkeepsie, N. Y.

Public Health Nursing Consultant (Assistant to Director of Public Health Nursing in State Health Department)—Give consultation to public health personnel in all phases of public health nursing, including in-service education; prepare manuals, guides, etc., for public health nurses; assist in administration of program. Bachelor's degree in public health nursing minimum preparation: master's degree desirable; four years' experience in public health nursing, including two

in administration or supervision. Salary: start at $6,264; maximum $6,876. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write E. H. Jorris, M.D., Assistant State Health Officer, State Office Bldg., Madison 2, Wis.

Public Health Engineer—for progressive county health department in rapidly growing, attractive suburban area of Kansas City, Mo., 12 miles downtown by superhighway. Degree in civil or sanitary engineering and supervisory experience required. Mileage, annual and sick leave, and other privileges. Salary commensurate with qualifications. Apply to Director, Clay County Health Department, Liberty, Mo.

Public Health Engineer—for county health department, population approximately 100,000. Salary range $7,500-$9,000 per annum. Write to Dr. Neil Gordon, Commissioner, Chemung County Health Department, Elmira, N. Y.

Senior Public Health Engineer—to assume full charge of environmental sanitation program, county unit. Requirements: state professional engineering license or eligibility, academic degree in sanitary engineering, two to five years of experience, according to educational qualifications. Salary $8,000. Write Columbia County Department of Health, 363 Allen St., Hudson, N. Y.

Opening for **Sanitary Engineer I**—in Utah State Department of Health. B.S. in sanitary engineering or civil engineering with sanitary option. Salary range $455 per month to $555 per month. Advancement to higher grades possible with experience. Write Dr. George W. Soffe, Interim Director of Public Health, Utah State Department of Health, 130 State Capitol Bldg., Salt Lake City 14, Utah.

Sanitarian—St. Louis Park, Minn. Challenging opportunity to develop an environmental sanitation program in this Minneapolis suburb. Job entails responsibility for planning sanitation activities and use of independent judgment in solving field work problems in the city. Applicants with M.P.H. degree and some sanitarian experience desired. For further information write City Manager, 5925 West 37th St., St. Louis Park 16, Minn.

Health Educator III—$455-$533. One year of graduate study in public health education in accredited school and one year of experience in health education. Arizona Merit System, 11 North 17th Ave., Phoenix, Ariz.

Health Educators—$415-$481 or $481-$556 per month, depending on experience. San Francisco Bay Area. Progressive, growing department. Requires M.P.H. or college graduate plus two years' health education experience. Alameda County Civil Service, 188 12th St., Oakland 7, Calif.

Health Educator—Initiate and develop community health education programs in city-county area of 330,000 population. Desirable qualifications: M.P.H., plus two years' experience in public health or related education work. Salary $5,122-$6,214; liberal benefits. Write W. B. Prothro, M.D., M.P.H., Public Health Director, Health Department, Grand Rapids 2, Mich.

Public Health Educator III—Initiate and develop school-community health education programs in a multicounty district. Desirable qualifications: M.P.H. degree, plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary $482-$577 per month. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write Dr. Amy L. Hunter, Director, Bureau of Maternal and Child Health, Wisconsin State Board of Health, Madison 2, Wis.

Opportunities for **Health Educator, Physical Therapist, and Director, Vital Statistics**—Virginia. Liberal vacation, sick leave, state retirement, Social Security, and merit system status. Director of Vital Statistics—Richmond. Salary range $7,032-$8,784. Completion of major in mathematics, including six semester hours in statistics and three years' experience, preferably in public health statistics. Health Educator—Fairfax County. Salary range $5,352-$6,672. College degree, major or minor in journalism or public relations and three years' experience. Physical Therapist—Fairfax County. Salary range $5,120-$6,120. Eligible for license in Virginia; three years' experience. Write Personnel Director, State Health Department, Richmond, Va.

Wanted: **Physician** qualified in public health aspects of tuberculosis to work under local health officer. Salary $12,500. Apply: Hugh H. Smith, M.D., 3134 Via Palos Verdes, Tucson, Ariz.

Director of Health—with the city of Kenosha, Wis. Population 60,000. Under the general direction of the Mayor and/or Board of Health to be responsible for preservation of the public health; prevention of the spread of communicable diseases; and enforcement of laws relating to public health and sanitation; to serve as chief administrative officer of the Department of Health which has been organized for over 25 years and includes a nursing staff, environmental sanitation staff, and laboratory facilities and personnel; and to perform other work as necessary to carry out statutory responsibilities. The salary is open. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write Mayor Eugene R. Hammond, Room 17, City Hall, Kenosha, Wis.

Tuberculosis Medical Department Director—to administer eight-person medical department. Duties include direction of mobile x-ray unit, film interpretation, demonstration tuberculin testing program, educational programs for medical students and other student professional groups, and maintenance of close working relations with a variety of institutions and organizations. Salary open. Vacation, sick leave, temporary disability, Social Security and retirement benefits. Write to C. W. Kammeier, Wisconsin Anti-Tuberculosis Association, 1700 W. Wells St., Milwaukee 1, Wis.

Public Health Nurse—for County Health Department in community offering pleasant living within two-hour drive of San Francisco Bay Area, mountain resorts, ocean beaches. Generalized program. Car furnished. Five-day, 40-hour week, three weeks' vacation, 11 paid holidays, paid sick leave, retirement and Social Security plans. Good working conditions. Requires California registration. Start $382-$460, depending on qualifications. Contact R. S. Westphal, M.D., Stanislaus County Health Dept., P. O. Box 1607, Modesto, Calif.

Public Health Nursing Positions—available in combination Health Department and Visiting Nurse Service. Public health nursing preparation required. Generalized service. Agency in a university community. Beginning salary $4,326-$4,771, depending on education and experience. Social Security. Please write Miss Patricia Walsh, Nursing Director, Washtenaw County Health Department, County Bldg., Ann Arbor, Mich.

Executive Director—Visiting Nurse Association, generalized program, including diagnostic chest clinics, nine-nurse staff. Supervisory experience in AVNA and degree required. Salary open, depending on qualifications. Write Mrs. William J. Wilson, President, Visiting Nurse Association, 2332 Pacific Ave., Atlantic City, N. J.

Public Health Nurse—Must be eligible for license in Ohio; city health department generalized program. Forty-hour week, retirement plan, paid vacation and sick leave. Salary $4,992-$5,724 maximum at end of three years, plus $276 and $300 longevity increments at end of 10 and 20 years; salary adjusted yearly to cost-of-living index. Write Health Commissioner, City Hall, Painesville, Ohio.

Public Health Nursing Supervisor—with voluntary agency doing a bedside nursing program in Houston, Tex. Staff of 26 nurses; casework consultant. Forty-hour week; 21 days' vacation; good personnel policies. Salary open. Car allowance. Write Director, Abbie G. Whidden, 2616 S. Calumet, Houston 4, Tex.

Public Health Nurse Supervisor—Excellent opportunity. Salary range $400-$500 per month. Good fringe benefits. Seven-nurse staff. Generalized program with public acceptance. Population 60,000. Degree and public health experience. Director, City-County Health Department, Eau Claire, Wis.

Medical Analysts—Minimum qualifications: master's degree in biostatistics, public health, or biology, and at least two years of responsible experience in the investigation of problems in public health, medical sciences, or biologic sciences, or in the teaching of biostatistics. Salary $7,420-$8,905. State merit system positions with Social Security plus State Employees' Retirement System benefits, sick and annual leave. For information or applications, write Arthur S. Kraus, Sc.D., Chief, Division of Vital Records and Statistics, State Department of Health, 2411 N. Charles St., Baltimore 18, Md.

Sanitarian—for state level position located in Alamosa, Colo., as district sanitarian. Salary range $442-$572. Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Oral Hygienist—to promote a program of dental health education and provide prophylaxis and applications of fluoride to school children on a demonstration basis. Requirements: certificate from an accredited school of dental hygiene; eligibility for licensure in Alabama. Salary $3,360-$4,320 plus mileage and per diem. Liberal personnel policies; retirement plan; Social Security. For further information, contact Personnel Officer, State Health Department, State Office Bldg., Montgomery 4, Ala.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Public Health Physician—Dutch, M.D., D.P.H., 31, married. Special training in communicable diseases and immunizations; experience in smallpox projects and public health education; easy linguistic facilities: French, English, German; cooperative and ambitious. Demobilizing in June, desires position in (sub)tropical country. Eric P. van der Esch, M.D., 69th Staging Post, Morssingel 1036, Leiden, The Netherlands.

Public Health Administrator—Ph.D., F.A.P.H.A. Scientist and administrator, organizer-director of broad public health programs. Experienced in coordinating interdepartmental and interorganizational interests

in environmental health problems and organizing and executing public and community relations programs. Have given administrative guidance and research consultation on research and development projects. **Box C-43,** Employment Service, APHA.

Instructor or Administrator—M.P.H. Excellent background in public health education and administration (seven years) with official and voluntary nonprofit agencies. **Box C-36,** Employment Service, APHA.

Health Educator—R.N., B.S., M.S. Experience in classroom teaching, school nursing, school health education. Desires position teaching school health or related subjects in college, junior college, school of nursing, or combination of teaching and school nursing, or health education position with city health department. Prefer Rocky Mountain states or Midwest, community 100,000 or under. **Box HE-91,** Employment Service, APHA.

Senior Administrative or Academic Position—M.D., M.P.H., 46. Wide experience in public health administration, teaching, laboratory, tropical medicine, research. Ten years' clinical experience. At present administrator of city health department (200,000) and instructor at school of public health. Would consider unusual administrative possibility or academic and research opportunities. Available at three months' notice. **Box PH-90,** Employment Service, APHA.

Nutritionist—B.S. and M.S. degrees. Now working in municipal public health. Have state public health and research foundation experience. Interested in public health education, or teaching nutrition, or commercial consumer education. Write **Box N-10,** Employment Service, APHA.

Hospital Administrator, Public or Professional Relations—Young lady, excellent education. Medical background with advanced experience which includes entire audiovisual presentation area. Desires position as hospital administrator or in public or professional relations for a hospital, medical center, service agency, or pharmaceutical laboratory. **Box C-44,** Employment Service, APHA.

Administrative Assistant in Program Development and/or Research—M.S.P.H., B.A. in social sciences, experience in areas of health education, related program administration, and in research. Male, 30, single. **Box C-45,** Employment Service, APHA.

Supervising Sanitarian—Age 35, married, four children. B.S., food technology; M.P.H., sanitary science. Seven years' experience in the food industry, including supervisory capacities. Eight years' experience as food and environmental public health sanitarian. Registered in two states. Active in professional organizations. Midwest or Great Lakes area preferred. **Box S-35,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Public health physician to direct overall program of health services, including those of teacher-nurse service, hearing and vision conservation program; would consult with school administrators, teachers, parents, nurses, representatives of official and nonofficial agencies in promotion of health services; city of several million; Midwest. (b) Assistant director of public health; progressive school system; California. (c) Student health physician; university, 10,000 students; Midwest; $10,000. (d) Public health nurses for following faculty posts: instructor in maternal and child care nursing; instructor or assistant professor in medical-surgical nursing; supervisor in psychiatrics and public health administration; collegiate school, Pacific Coast. (e) Head nurse qualified to supervise, large group of general duty nurses and clinical medicine division; one of leading industrial companies; foreign; salaries: $770 and $850 monthly including maintenance, all traveling expenses. (f) Public health nursing consultant; excellent opportunity to demonstrate administrative ability; Southwest department of health; also Midwest; salary to $7,000. (g) School nurse, five schools in college town, Wisconsin; $5,200 plus travel.

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

RADIATION PROTECTION—By Carl B. Braestrup and Harold O. Wyckoff. Springfield, Ill.: Thomas (301-327 East Lawrence Ave.), 1958. 361 pp. Price, $10.50.

This is a useful text which fills a need that has existed for some years. It provides a complete source of information on the practical aspects of radiation protection. This book should be of value to anyone concerned with problems of radiation protection.

The authors are eminently qualified as experts in the subject field. Their experience makes this an authoritative text.

The style and type make this book easy to read. While the publishers hold this to be a book "understandable to professional people who are not specialists in this field," it is doubtful if the contents would be fully comprehended by a person who has not had some background of training or experience in the fundamentals of radiation physics.

A somewhat abbreviated review of the fundamentals of radiation production and measurement and a condensed discussion of biological effects of radiation are given. Shielding methods and hazard control are covered fully with specific applications to practical problems of design associated with various types of x-ray and megavolt installations and radioactive sources. There are numerous illustrations, graphs, and tables. The appendix contains graphs that should be particularly useful to persons designing or checking radiation shielding.

P. W. PURDOM

ENVIRONMENTAL SANITATION—By Joseph A. Salvato, Jr. New York, N. Y.: Wiley (440 Fourth Ave.), 1958. 660 pp. Price, $12.00.

The author has undertaken the difficult task of preparing a manual of practice in the very broad field of environmental sanitation. He has succeeded admirably in this endeavor, and his book will find wide acceptance and use by persons in all disciplines associated with public health and the planning and construction of community improvements. His book is the only one of its kind and it effectively interprets and relates public health theories and principles to actual field conditions and practices. He suggests approaches and possible solutions to many problems of water supply, waste disposal, swimming pools, food and milk, insect, weed, and rodent control, housing, and environmental sanitation planning and administration. Heretofore much of the information presented could be found only in the files of public health departments, consultants, and government engineering divisions, in various technical journals, or in the minds of workers in the field.

The first chapter on the control of communicable diseases is particularly good and effectively sets the scene for the detailed discussions which follow. The book contains much sound advice for everyone concerned with the planning, financing, and construction of water and sewage facilities for small towns and fringe areas. This includes bond buyers, real estate developers, and prospective home buyers as well as those more directly involved with the engineering and health aspects of such projects.

The book avowedly is aimed primarily at the sanitation problems in communities of less than 5,000 persons, but these problems of satellite areas are also of interest and concern to officials and residents of larger cities and metropolitan districts. Many of the basic principles set forth apply equally well to larger communities.

RUSSELL L. CULP

INTEGRATING THE APPROACHES TO MENTAL DISEASE. Two Conferences Held Under the Auspices of the Committee on Public Health of the New York Academy of Medicine—Edited by H. D. Kruse. New York, N. Y.: Hoeber (49 E. 33rd St.), 1957. 393 pp. Price, $10.00.

This book is an interesting exploration of the problem of causation in mental illness. It contains the papers and discussions of the 48 participants at two conferences arranged by the Committee on Public Health of the New York Academy of Medicine. The objective of the meetings was to consider multidisciplinary approaches to further research and study on mental diseases and in so doing to see whether it was possible to achieve some conceptual unification as to the causation of such conditions. The different schools of thought on this problem were classified in four major groupings: organic, experimental-psychological, psychodynamic and psychosocial. The result of these conferences is a panoramic view and in it one can see why the study of mental illness has made such slow progress. Clearly the solution to the problem of mental disease is not yet in sight, but one obtains a picture of the varying points of view, of how little is actually known, and how much is speculative in this field. This book will be of interest to anyone concerned with mental illness and the basis for community action to deal with this problem. GEORGE ROSEN

SURGICAL CONVALESENCE—F. Curtis Dohan, consulting editor. Annals of the New York Academy of Sciences, Vol. 73, Art. 2. New York, N. Y.: The Academy (2 East 63rd St.), 1958, pp. 381–538. Price, $4.00.

A conference on surgical convalescence held in March, 1958, and sponsored jointly by the New York Academy of Sciences and the American College of Surgeons produced the papers which comprise this excellent monograph. While the title of this publication may limit inadvertently the attention of its potential readers to those interested in the practice of surgery, the contents of this collection of papers deserve the thoughtful attention of a wider audience.

Consider for example the contention of Moss and Dohan in their paper, "When Does Convalescence End?", that "many individuals are advised to undergo far longer convalescence than is necessary." This implication of unnecessarily prolonged convalescence should not be overlooked by those who are interested in the burgeoning costs of medical care and of disability.

The 15 papers included in this monograph are prefaced by introductory remarks by Emerson Day (Memorial Center for Cancer and Allied Diseases, New York) and by I. S. Ravdin (School of Medicine, University of Pennsylvania) and are followed by the concluding remarks of F. Curtis Dohan and N. Henry Moss (School of Medicine, University of Pennsylvania). The papers deal with the physiological, psychological, and the socioeconomic factors involved in convalescence following surgery. There is a lucid and comprehensive review of the postsurgical dynamics of body composition, metabolism, visceral function, and endocrine function by Moore ("Getting Well: The Biology of Surgical Convalescence") and by Hardy ("Metabolic Response to Surgery: Systemic, Adrenal, and Compositional"). Other papers dealing with the physiological aspects of convalescence following surgery are those by Taylor and Keys ("Criteria for Fitness and Comments on Negative Nitrogen Balance") and by Dunphy ("Repair of Tissue After Injury"). Gold in his paper, "Early Ambulation and Return to Full Duty in the United States Air Force," provides evidence that the average time required for convalescence following common surgical procedures is approximately one-third of the average period for civilians of comparable age as reported in Saffeir's paper, "The

Duration of Surgical Convalescence as Indicated by Insurance Statistics," and by Flemming in his paper, "Return to Work After Surgery: An Industrial Study." Hawley in his paper, "Sociological Importance of the Convalescent Period," reports that available evidence suggests that the period of disability following surgery can be reduced by one-fourth with a consequent annual saving to the national economy of more than one billion dollars.

Other equally thought - provoking papers make "Surgical Convalescence" a must for those interested in the problems of medical care.

BERNARD D. DAITZ

SOLVING THE SCIENTIST SHORTAGE— By David C. Greenwood. 68 pp. Price, $2.00.

SCIENCE AND EDUCATION AT THE CROSSROADS—A VIEW FROM THE LABORATORY—By Joseph William Still. 140 pp. Price, $3.75. Washington, D. C.: Public Affairs Press (419 New Jersey Ave., S.E.), 1958.

To those engaged in public health work, shortages of trained personnel have existed in varying degrees for some decades, but in other professions a "cause for alarm" was not discernible until the Sputnik era was inaugurated in October, 1957. Since then our whole educational process has been under close, and often critical, scrutiny with major emphasis being directed toward science and the training of scientists.

The first of these books (Greenwood) deals with the problem in a scholarly, analytical fashion, but is restricted largely to the field of engineering (civil, electrical, mechanical, etc.). In fact, one sometimes gets the impression that the author considers the words scientist and engineer to be synonymous. This does not detract from the possible value of the book, as conclusions regarding engineers may be applied in large measure to other disciplines.

The author first analyzes the nature of the problem, going into such factors as teacher shortages, general educational failures, demands for specialized personnel, incentives, etc. He then considers the present-day educational outlook and the programs conducted by government, industry, professional associations, and educational institutions of various kinds, ending with recommendations directed toward these groups for future action.

Dr. Still in his book treats the subject from a more comprehensive viewpoint, relating the problem to political ideals, world peace, cultural development, etc. He approaches the subject from short-range and long-range aspects in two sections of the book, the former covering "the organization and administration of science, both in and out of government; motivation and encouragement of students; improvement of teaching and expansion of research; financial and other support for teachers and scientists; and communication between scientists and between science and the general public."

The long-range view relates science and education to automation and its effects; a welfare state economy which may result from inadequate use of leisure; the possibility that cheap atomic energy may disrupt our economy; and uncontrolled population growth, especially in the presently undeveloped countries. Dr. Still feels that we should adopt "as a major policy the objective of helping the underdeveloped countries move towards standards of living comparable to ours by the year 2000," which strikes one as a worth-while goal for reasons not altogether altruistic. This section of the book contains a number of vital concepts, both philosophical and practical, and is worthy of consideration by everybody. Perhaps discussion groups might be stimulated to probe further into topics which do indeed mean so much to the future of our race.

JAMES L. TROUPIN

CURRENT CONCEPTS OF POSITIVE MENTAL HEALTH: MONOGRAPH SERIES NO. 1—Joint Commission on Mental Illness and Health. New York, N. Y.: Basic Books (59 Fourth Ave.), 1958. 136 pp. Price, $2.75.

This volume initiates the eagerly awaited series of monographs through which the Joint Commission on Mental Illness and Health will report its findings. It is hoped that these reports will provide definitive answers to at least some of the questions which have long troubled psychiatry and its related professions.

Perhaps the first question which requires an answer is the one to which this volume is directed: What indeed is "mental health"; can a definition be found which is operationally valid and scientifically accurate? If it cannot be said that the author and her distinguished co-workers succeed in answering this question, it may be enthusiastically stated that they provide a brilliant analysis of the problems attendant on the quest for such a definition, and a challenging critique of the numerous earlier attempts to accomplish this.

And, for such a brief book, it does much more than that: it suggests the theoretical difficulties which have impeded earlier work and, most importantly, it moves from "ideas to systematic research" in a lucid and comprehensive chapter which will challenge anyone who has an ongoing interest in the field of mental health.

The report contains as well a compelling riposte by Walter Barton expressing the clinician's understandable disagreement with Jahoda's more theoretic and nonmedical formulations. It adds much to the value of the book.

If the rest of the commission's publications succeed as brilliantly as this first volume, all of us will indeed be tremendously in their debt for a great and dedicated effort thus brought to a fitting conclusion.

SOL WIENER GINSBURG

THE EXAMINATION OF WATERS AND WATER SUPPLIES (7th ed.)—By E. Windle Taylor. Boston, Mass.: Little Brown (34 Beacon St.), 1958. 841 pp. Price, $18.50.

The seventh edition fully continues the previous high standard of this book and includes much new material essential to bring it into conformity with changes and advances in the science of water analysis. To meet the increasing problems of radioactive pollution a new chapter is included which discusses methods for radioactive examinations and their application and significance. Newer chemical methods such as the EDTA test for hardness, technics for the estimation of surface active compounds, and many other pertinent procedures are included. The use of instrumental procedures for the estimation of such elements as sodium and potassium has not been overlooked. In the bacteriological section the significance of various intestinal organisms including the fecal streptococci are considered in detail and methods for their detection are included. The application of the membrane filter technic to bacteriological examinations is throughly explained. The older and more standardized procedures are treated completely.

An interesting new chapter discusses the examination of uncooked food stuffs for contamination due to the use of polluted water for washing and preservation of these materials.

The chapters on microscopical and biological examinations have been much improved by the substitution of photographs for line drawings as illustrations of pertinent microorganisms.

Although this book has not been a compilation of standard methods and procedures, it has long been the sole reliable reference for interpretation of water analyses and the seventh edition is of even greater value as a reference volume. Although written to conform to British practice and to geological and other conditions in England, the basic

information it contains makes this edition of the book of inestimable value to those concerned with problems of water quality and sanitation and thus it is an essential reference book in their libraries. F. WELLINGTON GILCREAS

EDUCATORS GUIDE TO FREE SLIDEFILMS (10th annual ed.).—Randolph, Wis.: Educators Progress Service, 1958. 206 pp. Price, $6.00.

Although the slidefilm (or filmstrip as it is also called) rates far behind the motion picture in popularity and use, there is certainly much to say for it as an effective audiovisual teaching aid. While the motion picture moves ahead at a determined and uncontrollable speed, possibly arousing a confusion here and an ambiguity there, the slidefilm, whether silent or sound, can be stopped while the teacher, lecturer, or discussion leader helps the group to a better understanding of the subject or point under consideration.

Classroom teachers in elementary and secondary schools will find in this catalogue an amazingly large number of free slidefilms on virtually every subject in the curriculum. Public health workers, on the other hand, will find their interests limited primarily to the sections on "Health and Social Hygiene" and "Science." Included in both of these categories are 91 of the authoritative slidefilms produced by the Communicable Disease Center of the Public Health Service. Many of these are of special interest to sanitarians, epidemiologists, and laboratory workers. Also included in this series are 11 slidefilms designed as teaching aids for persons with diabetes. Quite a few slidefilms of interest to home economists, nutritionists, and persons interested in safety are listed in other sections.

Users of this catalogue will note a vast number of slidefilms which are commercially sponsored. Though many of these are of good quality, others overemphasize a particular product or commercial organization.

The annotations are well written, giving clear-cut descriptions, date of release, running time, conditions of loan, and other details. The catalogue is divided into sections according to titles, subjects, and sources; each section is on paper of a different color.

If you would like to be kept up to date on free slidefilms, this catalogue may be one answer to your problem. However, slidefilms at low-cost rentals, available from other sources, should not be overlooked. JOSEPH KADISH

LEPTOSPIROSIS—By J. M. Alston and J. C. Broom. London, England: E. and S. Livingston. Baltimore, Md.: Williams and Wilkins (Mt. Royal and Guilford Aves.), 1958. 367 pp. Price, $8.50.

The volume represents one of the best summations of leptospiral infection in man and animals that has yet appeared.

The approach has appeal for microbiologist, pathologist, clinician, epidemiologist, veterinarian, and even includes a special chapter on medicolegal aspects contributed by C. J. A. Doughty.

Among the most impressive sections are the presentation of the extensive distribution of the problem, the difficulty in establishing the diagnosis, the differences in methodology in the laboratory, and the probable tremendous number of missed cases that are probably occurring constantly.

Also impressive is the relatively small number of investigators who have contributed to the problem from the United States, despite the fact that leptospirosis presumably costs the cattle and pig breeders in this country alone close to one hundred million dollars annually.

A more expanded discussion of the varied problems of differential diagnosis of these infections might be more helpful to the clinician, but a widespread dis-

tribution of this book cannot fail to increase awareness of leptospirosis and lead to better recognition of the infection.

The book discusses the various existing laboratory aids to diagnosis, as well as indicating the need for more uniform accurate diagnostic procedures, which would certainly aid in the definition of the magnitude of the problem.

The section on laboratory technics and an encyclopedic bibliography of investigations of leptospirosis round out an excellent presentation of a complex public health problem. PHILIP A. BEARG

EMOTIONAL DYNAMICS AND GROUP CULTURE—By Dorothy Stock and Herbert A. Thelen. New York, N. Y.: New York University Press (Washington Sq.), 1958. 296 pp. Price, $6.00.

Have you been to Bethel or to the Human Dynamics Laboratory in Chicago, Ill.?

During the past 11 years many APHA members have received human relations training at the National Training Laboratories of the National Educational Association. All who have done so have been subjects for the research which is so much a part of the training program.

"Emotional Dynamics and Group Culture" is the second of a research training series presenting studies carried out in these laboratories. Most of the research reported in this volume was conducted in the Human Dynamics Laboratory at Chicago; part of it was carried out at Bethel. The authors have had active leadership roles in both laboratories.

Students returning from the laboratories brought back with them terms like fight, flight, dependency, pairing, group work, valence, group culture, etc., which are concepts growing out of the theoretical articles published by W. R. Bion of the Tavistock Institute in London, England, in articles in "Human Relations" from 1948 to 1951. The authors have made a bold attempt to test hypotheses related to these somewhat psychiatrically orientated concepts and have achieved considerable success in their efforts.

The theoretical chapters compel one to return once more to the early chapters of McDougall's provocative "Group Mind," published almost forty years ago and rejected by psychologists and sociologists alike. When we speak of "group culture," "group behavior," "group growth," and "group purpose," to what extent are we slipping back into this early pattern of conceptualization?

For the serious student, this book is an exciting mixture of theory, conceptual explorations, experimentation, and analysis. It is at once challenging and rewarding. Researchers and practitioners of group process and also others seeking to understand individual and group behavior will find it a stimulating source of ideas. It deserves a place on the shelf alongside Cartwright and Zander's "Group Dynamics."

ANDIE L. KNUTSON

POLIOMYELITIS—Papers and Discussions Presented at the Fourth International Poliomyelitis Conference—Compiled and Edited for the International Poliomyelitis Congress. Philadelphia, Pa.: Lippincott (East Washington Sq.), 1958, 684 pp. Price, $7.50.

This is a monumental volume marking the fourth triennial international conference on poliomyelitis and includes 35 reports of official delegates of participating nations, some 60 formal scientific addresses and the ensuing discussion, and the summaries and general remarks presented at the final plenary session. At such scientific conclaves the participants usually stress the unsolved problems and unanswered questions that face them and this conference was no exception. Yet, what a remarkable record this is of the accomplishments achieved between the first conference in New York in 1948 and this one in

Geneva in 1957! In fact, the fundamental knowledge accumulated since the Rome conference in 1954 and recorded in this volume is truly stupendous. This is true, particularly when one realizes that one of the high points of the session less than five years ago was a preliminary report by Jonas Salk, establishing the antigenicity in human beings of a formalinized virus vaccine harvested from monkey kidney tissue culture and the administration of this vaccine to human beings without injury or ill-effect. In the spring of that year the National Foundation had launched its vaccine field trial, but the effectiveness of the vaccine against paralytic polio was still to be established.

The volume is divided into two major sections. The first and major section is concerned with virology, including vaccination, the enteric viruses resembling poliovirus, viral diagnosis, and the elucidation of basic principles applicable to the study of all viruses; an important chapter is devoted to the characteristics of mammalian cells studied in tissue culture. The second section is devoted to progress in the care of the paralyzed patient, both in the acute phase and subsequently when the preservation and restoration of function are important considerations.

Though the conference was clearly oriented to the future, this reviewer was surprised to find reference only once, and then only in the informal discussion, to the following type of inquiry: "Unquestionably one of our future problems is going to be, 'How can a population be induced to accept vaccine to the required level for the complete control of the disease?' Nowadays, one third of all of our cases of poliomyelitis in Britain occur in those over fifteen years of age. How can we persuade adults to be immunized to the fullest possible extent during the early phase of a mass campaign? This is a matter which undoubtedly will be solved in different countries by different ways, but in a country such as Great Britain where mass 'anything' is questioned, it will require a considerable effort to persuade adults to be immunized." It is reasonable to assume that this discussant did not mean to imply that the problem of immunizing all children had yet been solved. Perhaps, those who are now planning the fifth international conference are giving attention to this problem and the sponsoring agencies are now encouraging and assisting qualified social scientists to investigate and report on this project in 1960. Certainly, research technics are as applicable to the study of human behavior as they are to the behavior of viruses.

THOMAS D. DUBLIN

SAMPLING OPINIONS: AN ANALYSIS OF SURVEY PROCEDURES—By Frederick F. Stephan and Philip J. McCarthy. New York, N. Y.: Wiley (440 Fourth Ave.), 1958. 451 pp. Price, $12.00.

This excellent volume examines sampling not as a separate set of ideal decisions but as procedures intimately related to such other components in the survey research process as costs, estimation, and measurement. A distinctive feature of the book is that its discussion of sampling continually focuses on opinion or attitudinal data. To achieve this focus the authors assemble a wealth of research findings, some from the literature and others especially developed for this purpose. The writers deliberately omit material covered by others, but skillfully link their presentation to other relevant works on sampling.

The book is divided into three sections. The first is introductory and contains useful conceptual models and principles for the selection and measurement processes. The second, constituting the core of the book, analyzes various empirical studies. Here the authors break new ground and indicate the necessary areas for further research. In this sec-

tion the reader encounters the best attempt to date to assess the potentialities and limitations of quota sampling. This section also discusses the uses and limitations of check data and of comparisons with other survey results as means of evaluating sampling methods. Respondent accessability and cooperation and interviewer behavior and performance are among the practical problems treated in this section. Section three treats the actual problems that arise in designing and carrying out a survey. The reader seeking a precise technical model will be disappointed for this is not the intent of the authors.

The book is clearly written and, for the most part, requires little mathematical background. However, the book's clarity and simplicity can be deceptive. It will be especially meaningful to those who have had experience with survey research. The book has many virtues, not least of which is that it is an antidote to the fashionable formulas for social research and the common tendency to attribute special magic to sampling. The book points up practical considerations in survey operations and should be helpful both to practitioners as well as research workers. SOL LEVINE

SIMPLE METHODS OF CONTRACEPTION: AN ASSESSMENT OF THEIR MEDICAL, MORAL AND SOCIAL IMPLICATIONS—Edited by Winfield Best and Frederick S. Jaffe. New York, N. Y.: Planned Parenthood Federation of America, Inc. (501 Madison Ave.), 1958. 64 pp. Price, $.25 for postage.

This book is the report of a symposium attended by physicians, social scientists, and clergymen. The small volume records an interesting interchange of opinions about the religious and social implications of sexual morals and contraceptives. There are also reports of a small series of clinical tests with varied systems of contraception. Neither the social nor medical sections are conclusive.

A BIBLIOGRAPHY OF INTERNAL MEDICINE—COMMUNICABLE DISEASES—By Arthur L. Bloomfield. Chicago, Ill.: University of Chicago Press, 1958. 560 pp. Price, $10.00.

Recognizing that some understanding of the development of ideas and knowledge is essential to the medical student and the physician for a critical comprehension of medicine, the author of this book, more than two decades ago, began to develop a critical, selected bibliography of the important contributions to modern medicine. The volume under review covers the communicable diseases in a useful manner. References of fundamental importance have been included, although the very recent literature has had to be appraised in tentative and necessarily limited fashion. This bibliography is primarily for clinicians and for those with a general interest rather than for specialists. Since many of the papers and books are in languages other than English, or in journals difficult to obtain, abstracts or translations follow most of the references. This is a useful publication and should be available in schools and agencies to students and practitioners of the health professions.

EXPERT COMMITTEE ON MEDICAL REHABILITATION. FIRST REPORT—World Health Organization Technical Report Series, 1958, No. 158. New York, N. Y.: Columbia University Press (2960 Broadway), 1958. 52 pp. Price, $.60.

In this report the WHO considers the concept and principles of physical, vocational, and social rehabilitation. Reference is made to social and economic conditions which affect rehabilitation programs and specifically the report deals with the organization of appropriate services for the handicapped. The report assesses the quantitative aspects of rehabilitation in various countries and discusses certain aspects of technical and medical training programs. Espe-

cially important is the emphasis placed on cooperative program planning between medical, public health, education, welfare, social security, employment, and voluntary organizations throughout the several levels of community organization.

THE BIRTH OF NORMAL BABIES—By Lyon P. Strean. New York, N. Y.: Twayne Publishers (31 Union Sq. West), 1958. 194 pp. Price, $3.95.

This book deals with pregnancies that end in failure—that is, miscarriages, stillbirths, and birth defects in the newborn child. The author produces evidence that events occurring during intrauterine life affect the developmental process. For example, infectious disease or trauma may interfere with tissues or organs at a sensitive time in their formation, depending on when in the course of pregnancy the particular stress happens. Case histories are presented and precautionary measures are suggested which should lead to the birth of more normal babies.

THE PSYCHOANALYTIC STUDY OF THE CHILD—Edited by R. S. Eissler; Anna Freud; et al. New York, N. Y.: International Universities Press (227 West 13th St.), 1958. 573 pp. Price, $8.50.

The 22 papers in this annual volume include several in memory of Ernst Kris, a group of papers on adolescence, a number of contributions to psychoanalytic theory, several papers based on cases under analytic treatment, and other miscellany. The total lack of editorial comment is a policy which the editors might consider modifying in subsequent annals. As a whole, while there is certainly some material of interest to the general, i.e., nonpsychoanalytic reader, the book does not match the quality of earlier volumes in the series.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ANATOMY AND PHYSIOLOGY LABORATORY MANUAL (5th ed.). Catherine Parker Anthony. St. Louis, Mo.: Mosby, 1959. 320 pp. Price, $3.50.

ATLAS OF SURGERY FOR STUDENTS AND NURSES. F. Wilson Harlow. New York, N. Y.: Grune and Stratton, 1959. Price, $8.50.

CALIFORNIA HEALTH SURVEY 1956. Part I—Attitudes toward Salk Poliomyelitis Vaccine. Berkeley, Calif.: State Department of Public Health, 1958. Limited distribution.

CENTRAL NERVOUS SYSTEM AND BEHAVIOR, THE. Mary A. Brazier, Editor. New York, N. Y.: Josiah Macy, Jr. Foundation, 1959. 450 pp. Price, $5.25.

COLOR ATLAS OF MORPHOLOGIC HEMATOLOGY—With a Guide to Clinical Interpretation (rev. ed.). Geneva A. Daland. Cambridge, Mass.: Harvard University Press, 1959. Price, $6.75.

COMMUNICATIONS DES INVITES ETRANGERS. Congres National Des Sciences Medicales—Bucarest Mai 5-11, 1957. Roumaine: Editions De L'Academie De La Republique Populaire.

CONCEPTUAL AND METHODOLOGICAL PROBLEMS IN PSYCHOANALYSIS. Annals of the New York Academy of Sciences, Vol. 76, Art. 4. Leopold Bellak, et al. New York, N. Y.: The Academy, 1959. pp. 971-1134. Price, $2.75.

DRINKING AND INTOXICATION. Selected Readings in Social Attitudes and Controls. Edited by Raymond G. McCarthy. Glencoe, Ill.: The Free Press, 1959. 455 pp. Price, $7.50.

ECOLOGY OF HUMAN DISEASE, THE. Jacques M. May. New York, N. Y.: MD Publications, 1959. 327 pp. Price, $7.50.

ECOLOGY OF THE MEDICAL STUDENT, THE. Report of the Fifth AAMC Teaching Institute. Edited by Helen Hofer Gee and Robert J. Glaser. Evanston, Ill.: Association of American Medical Colleges, 1958. 262 pp. Price, $3.00 cloth, $2.00 paper.

EDUCATION FOR NURSING SERVICE ADMINISTRATION. An Experience in Program Development by Fourteen Universities. Mary Kelly Mullane. Battle Creek, Mich.: W. K. Kellogg Foundation, 1959. 242 pp. Price, $3.00.

EXPERIMENT IN MENTAL PATIENT REHABILITATION, AN. Henry J. Meyer and Edgar F. Borgatta. New York, N. Y.: Russell Sage Foundation, 1959. 114 pp. Price, $2.50.

EXPERT COMMITTEE ON MEDICAL REHABILITATION. First Report—WHO Technical Report Series No. 158. New York, N. Y.: Columbia University Press, 1958. 52 pp. Price, $.60.

FAMILY MEDICAL ENCYCLOPEDIA, THE. Justus J. Schifferes. Boston, Mass.: Little, Brown, 1959. 617 pp. Price, $4.95.

HEREDITY COUNSELING. Edited by Helen G. Hammons. New York, N. Y.: Hoeber, 1959. 112 pp. Price, $4.00.

HISTORY OF NEUROLOGY, A. Walther Riese. New York, N. Y.; MD Publications, 1959. 223 pp. Price, $4.00.

HISTORY OF OPHTHALMOLOGY, A. George E. Arrington, Jr. New York, N. Y.: MD Publications, 1959. 174 pp. Price, $4.00.

HOMEMAKER SERVICES IN THE UNITED STATES 1958:

A NATIONWIDE STUDY. William H. Stewart; Maryland Y. Pennell; and Lucille M. Smith. 106 pp.

TWELVE STATEMENTS DESCRIBING DIFFERENT TYPES OF HOMEMAKER SERVICES. 99 pp. Washington, D. C.: Gov. Ptg. Office, 1958. $.55 each.

HUMAN SIDE OF URBAN RENEWAL. Martin Millspaugh and Gurney Breckenfeld. Baltimore, Md.: Fight Blight, Inc., 1959. 233 pp. Price, $3.50.

LABORATORY METHODS. Air Pollution Control District—County of Los Angeles. Los Angeles, Calif.: The District, 1958. Price, $12.50.

MENTAL SUBNORMALITY. Richard L. Masland; Seymour B. Sarason; and Thomas Gladwin. New York, N. Y.: Basic Books, 1959. 442 pp. Price, $6.75.

METABOLIC FACTORS IN CARDIAC CONTRACTILITY. Annals of the New York Academy of Sciences, Vol. 72, Art. 12. Menard M. Gertler, et al. New York, N. Y.: The Academy, 1959. pp. 387-558. Price, $3.75.

NURSE-PATIENT RELATIONSHIPS IN PSYCHIATRY (2nd ed.). Helena Willis Render and M. Olga Weiss. New York, N. Y.: McGraw-Hill, Blakiston Division, 1959. 319 pp. Price, $5.95.

PHYSICAL DIAGNOSIS. John A. Prior and Jack S. Silberstein. St. Louis, Mo.: Mosby, 1959. 388 pp. Price, $7.50.

PHYSIOLOGY OF EXERCISE. (3rd ed.). Laurence E. Morehouse and Augustus T. Miller, Jr. St. Louis, Mo.: Mosby, 1959. 349 pp. Price, $4.75.

PLANNING EVALUATIONS OF MENTAL HEALTH PROGRAMS. Report of the Second Meeting of the Advisory Council on Mental Health Demonstrations. New York, N. Y.: Milbank Memorial Fund, 1958. 104 pp. Price, $1.00.

RECENT STUDIES IN EPIDEMIOLOGY. J. Pemberton and H. Willard. Springfield, Ill.: Thomas, 1959. 203 pp. Price, $5.75.

REHABILITATION OF THE PATIENT AT HOME OR IN NURSING HOMES. University of Michigan School of Public Health. Ann Arbor, Mich.: Continued Education Service, 1959. 98 pp. Price, $2.00.

RELAX AND FEEL BETTER. A Book-and-Record Course consisting of an Illustrated Manual and Two High Fidelity 33⅓ RPM Records. Karin Roon. New York, N. Y.: Crown Publishers, 1959. Price, $5.95.

SEDIMENTATION RATE OF HUMAN ERYTHROCYTES. Frank Wright. New York, N. Y.: Vantage Press, 1959. 43 pp. Price, $2.50.

SEXUAL PLEASURE IN MARRIAGE. Jerome and Julia Rainer. New York, N. Y.: Julian Messner, 1959. 251 pp. Price, $4.95.

SOCIAL ASPECTS OF PSYCHIATRY. Edited by Benjamin Pasamanick and Peter H. Knapp. Washington, D. C.: American Psychiatric Association, 1958. 208 pp. Price, $2.00.

SOCIAL WELFARE FORUM, 1958. Official Proceedings, 85th Annual Forum, National Conference on Social Welfare, Chicago, Ill., May 11-16, 1958. New York, N. Y.: Columbia University Press, 1958. 311 pp. Price, $5.00.

STAPHYLOCOCCUS PYOGENES AND ITS RELATION TO DISEASE. Stephen D. Elek. Baltimore, Md.: Williams and Wilkins, 1959. 767 pp. Price, $15.00.

THRILLS AND REGRESSIONS. Michael Balint. New York, N. Y.: International Universities Press, 1959. 148 pp. Price, $4.00.

TROUBLED CHILD, THE. Helen Moak. New York, N. Y.: Henry Holt, 1958. 176 pp. Price, $3.50.

YOUNG CHILDREN IN HOSPITALS. James Robertson. New York, N. Y.: Basic Books, 1959. 136 pp. Price, $3.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

? ? ? —Does dietary fat cause a rise in blood cholesterol? Will elevation of blood cholesterol cause atherosclerosis? Can dietary fat affect coagulation and fibrinologic activity? Can the cholesterol level be lowered by adding unsaturated fats to the diet? Does dietary protein affect cholesterol level? Can the atherosclerotic process be reversed? Would you expect to find unequivocal answers to all these questions in this paper—or anywhere else?

BARNES, R. H. Diet, Blood Cholesterol and Atherosclerosis. New York State J. Med 59, 3:474 (Feb. 1), 1959.

Imperative Call to Arms—"We in public health," said the Surgeon General at our late St. Louis meeting, "must become more sensitive to defense needs and must develop both the competencies and a focus of organization and action. Civil defense is an inter-locking job that calls for our greatest application of ingenuity, perseverance, and leadership. It is a challenge that we must meet now if we are to safeguard the Nation's future. We must make this our 'year of decision' in which we chart a course of action to meet whatever emergencies the future may hold."

BURNEY, L. E. Preparedness and Survival. Pub. Health Rep. 74, 1:1 (Jan.), 1959.

What and How You Ask—Are you contemplating a morbidity survey in connection with any new public health activity? The questions you ask and the way you ask them will influence answers you will get. Though you may be well aware of this fact, the paper is still worth your study.

CARTWRIGHT, A. Some Problems in the Collection and Analysis of Morbidity Data Obtained from Sample Surveys. Milbank Mem. Fund Quart. 37, 1:33 (Jan.), 1959.

Straw in Wind—Pioneering in the integration of midwifery with obstetric nursing is under way in a half dozen leading university hospitals. The maternity nurse of the future, predicts this author, will be educated in the humanities, the art and science of obstetrics, and in the comprehension of human need during this great life experience.

CORBIN, H. Maternity Nursing Education—Yesterday, Today and Tomorrow. Nursing Outlook 7, 2:82 (Feb.), 1959.

H-u-m-m!—Looked into were the food habits of groups of men and women teachers and men and women industrial workers living in an urban section of metropolitan Toronto. The survey led to the gloomy conclusion that health education had had little if any affect on food selection. The several authors suggest mildly, but reasonably, that more productive health education might be desirable.

FARQUARSON, C. D., et al. Food Intake of Teachers and Industrial Employees. Canad. J. Pub. Health 50, 2:80 (Feb.), 1959.

Work for All—These symposium papers read before the (British) Medical Society for the Care of the Elderly—and the society's happy escape from the millstone words "geriatrics" and "gerontology" is commended to your thoughtful

notice—take up the matters: (1) of bringing together all the agencies and professions now struggling toward that common goal, the welfare of elderly patients; and (2) of what in particular the health visitor might do toward attaining the goal.

FRY, J. Care of the Elderly in General Practice (and) WALKER, J. V. Gerontology and the Health Visitor. M. Officer 101, 2:19 (Jan. 9), 1959.

Health in Schools—Those of us who have any concern whatever with the health of young people, and few indeed must there be who have none, will enjoy and possibly be helped a little by the ten papers read in a St. Louis meeting symposium. "Reminiscing on School Health" and "How Fit Is Fit?" are hereby given special mention.

HEIN, F. V. Professional Problems and Progress (and nine related papers). J. School Health 28, 10:307 (Dec.), 1958.

What You Drink—All the hard-to-remove and potentially hazardous substances that may, and do, get into drinking water supplies from detergents to DDT are mentioned. Their number and variety lead irrefutably to the conclusion that we need to do a lot more than we are now doing to save our dwindling water supplies from still greater contamination. One smiles (grimly) at the antifluoridationists who go into such tantrums about the addition of a little innocent fluorine to all the stuff likely to be there!

HOLLIS, M. D. We Must Take a Hard Look at New Water Supply Problems. Water Works Eng. 112, 2:118 (Feb.), 1959.

Science at Work—As always, this annual review of what is current in nutritional research is required reading for all. Obviously it would be impossible to indicate here the enormous range of studies reported upon, but one quote (on the warmly debated matter of fat and blood) may be permitted: "Thus far, however, there has not been sufficient correlation for any one factor to permit a satisfactory prognosis for individuals, nor a firm basis for preventive measures dietary or otherwise."

KING, C. G. Advances in Nutrition. J. Am. Dietet. A. 35, 2:109 (Feb.), 1959.

Endemicity of Health—What causes health? Discussed here is an exploratory venture in the relationships between home life and 11-year-old school child health (as measured by some arbitary scales of school performance). The findings are offered more as a crude study of research method rather than as demonstrable truths. However, the author couldn't forgo mention of some of the findings, such as the comforting one that "the moderate use of corporal punishment appeared to be quite compatible with health!" (Exclamation point is the author's.)

LANDON, J. New Horizons in Epidemiology. Pub. Health 73, 5:165 (Feb.), 1959.

Children's Fitness Levels—Physicians who have anything to do with growing children have an obligation to help with their emotional and physical development: the job cannot be left to educators and physical directors. Such is the burden of this essay which asserts that this is a big social job that badly needs doing, if certain comparisons of children here and in Europe mean what they seem to indicate—that our children come out second best.

LANE, W. K. Role of Pediatrician in Physical Fitness of Youth. J.A.M.A. 169, 5:421 (Jan. 31), 1959.

George Does It—This paper bears eloquent testimony to the futility of "there ought to be a law." Alcohol education is legally demanded in schools everywhere. But what kind of education do the children get? A year was spent in an inquiry into what actually goes on in the schools pursuant to the various state laws. Some of the princi-

pals who were canvassed weren't at all sure of what was being taught and some had serious misgivings about what they suspected was being passed off as education.

LINDEN, A. V. Some Random Thoughts on Alcohol Education. J. School Health. 29, 1:3 (Jan.), 1959.

Sulfur and Molasses—There appears to be not much here that the widely-browsing reader won't have read, but this review article on an unpleasant and avoided subject is firmly brought to your notice. It is the nature of a dose that should be taken periodically, like the spring tonics of ancient memory. Our social obligation to alcoholism we (health people) gladly turn over to some Georges to do for us, just as we, as individuals, sensibly shun the village drunk if we can. What health officials should be doing is convincingly outlined here.

MCCARTHY, R. G. Alcoholism. Am. J. Nursing 59, 2:203 (Feb.), 1959.

Worms, et al.—Among a group of small Puerto Rican children living in Philadelphia, two of every five were found infested with intestinal parasites. T. trichiurus and G. lambia were the most common. Incidence of parasites increased with the children's ages.

MYERS, E. N., et al. Intestinal Parasites in Puerto Rican Preschool Children in Philadelphia, Pennsylvania, in 1958. Am. J. M. Sc. 237, 1:59 (Jan.), 1959.

Mental Illness Stigma—Expatients of a psychiatric clinic formed a club to let the people know that emotional illness can be cured. Their method is to send speakers to tell their own stories to any group sponsored by mental health associations. What happens at some of the meetings is told here.

OWEN, T. V., and STEMMERMANN, M. G. An Experiment in Public Education. Ment. Hyg. 43, 1:3 (Jan.), 1959.

Reminder—"It is important, therefore, that transportation of unrefrigerated (poliomyelitis) vaccine in temperate climates be carried out in as short a time as possible. . . . It is suggested that vaccine should not be held unrefrigerated for periods longer than seven days."

PERKINS, F. T., and YETTS, R. Stability of the Potency of Poliomyelitis Vaccine. Brit. M. J. 5113:31 (Jan. 3), 1959.

Health Examinations Examined—Periodic physical examinations of employees are not, as alleged, the keystone of preventive medicine. Many of the criticisms directed at them are justified in varying degree, but their yield in detecting unrecognized disease is measurable. They do have educational values, but only if their teaching potential is put to good use. This is true both for the individual examined and the over-all scientific knowledge of ill health (a symposium paper).

ROBERTS, N. J. The Values and Limitations of Periodic Health Examinations. J. Chronic Dis. 9, 2:95 (Feb.), 1959.

Turmoil and Lunatics—Two centuries of comment on the apparent causal relationship of social stress and mental illness are revealingly sampled. From the beginning the various elucidations of this long-held assumption have been colored by opinion and nonscientific views. Future studies, if they are to improve on the older dissertations, must be based on sound epidemiological and psychological principles. To these more scientific findings the historian may then be able to contribute some clarification.

ROSEN, G. Social Stress and Mental Disease from the Eighteenth Century to the Present. Milbank Mem. Fund Quart. 37, 1:3 (Jan.), 1959.

In Russia Now—Excerpts from a report on the care of defective children by a British observer: "The (psychiatric) services are remarkable in being generously staffed. Of particular importance is the abundance of nurses. . . . Psychological research in the U.S.S.R. is

large in quantity and much of it is of high quality. The laboratories I visited were well equipped with both Soviet and foreign apparatus. The originality of much of the work impressed me greatly." To be sure, a great deal of objective criticism leavens the enthusiastic comments.

TIZARD, J. Children in the U.S.S.R. Lancet 7060:1325 (Dec. 20), 1958.

For Safer Cigarettes—Briefly reviewed here is the research now going on in the commendable effort to make cigarettes less cancerogenic. "It is hoped" concludes the author, "that, with the evidence already at hand, a practical solution may be within our reach."

WYNDER, E. L. Laboratory Contributions to the Tobacco-Cancer Problem. Brit. M. J. 5118: 317 (Feb. 7), 1959.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Ave., New York 16, N. Y.
Am. J. M. Sc. (American Journal of the Medical Sciences), Lea & Febiger, 600 Washington Square, Philadelphia, Pa.
Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.
Canad. J. Pub. Health (Canadian Journal of Public Health), 150 College St., Toronto 5, Canada.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Am. Dietet. A. (Journal of the American Dietetic Association), 620 N. Michigan Ave., Chicago, Ill.
J. Chronic Dis. (Journal of Chronic Diseases), C. V. Mosby, 3207 Washington Blvd., St. Louis, Mo.
J. School Health (The Journal of School Health), American School Health Association, 3335 Main St., Buffalo 14, N. Y.
Lancet, 7 Adams St., Adelphi, London, W.C.2, England.
M. Officer (Medical Officer), Chronical House, 72-78 Fleet St., London, E.C.4, England.
Ment. Hyg. (Mental Hygiene), National Association for Mental Health, 10 Columbus Circle, New York 19, N. Y.
Milbank Mem. Fund Quart. (Milbank Memorial Fund Quarterly), 40 Wall St., New York, N. Y.
New York State J. Med. (New York State Journal of Medicine), 386 Fourth Ave., New York, N. Y.
Nursing Outlook, American Journal of Nursing Company, 2 Park Ave., New York 16, N. Y.
Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C.1, England.
Pub. Health Rep. (Public Health Reports), Gov. Ptg. Office, Washington, D. C.
Water Works Eng. (Water Works Engineering), Reuben H. Donnelly Corp., 305 East 45th St., New York 17, N. Y.

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Testing Health Education Methods

Closer cooperation of public health and agricultural extension personnel in intensifying health education activities in rural areas is being tried out in eight representative counties of Mississippi. These include about 12 per cent of the state's population as a sample for the pilot program. Under the program, the State Board of Health and the Extension Service have jointly employed a health education specialist. As the program moves into a county a conference is called with local health and extension workers to become acquainted with each other, to work out plans for supplementing each others programs, and to meet further needs. Susie Overstreet, health education specialist, State Board of Health and the Extension Service, is director of the demonstration.

As the program develops successfully, it is to be gradually extended over the entire state. It is to be hoped that a record and evaluation of the program will be a part of the program for what it may have by way of suggestion to others meeting rural health education problems.

Insurance and Industrial Medicine

In an "Industrial Medical and Occupational Health Programs" manual, the Aetna Casualty and Surety Company has done a real service in helping "industrial management set up and maintain desirable medical services for their employees, both within and outside the plant." The help goes beyond fulfilling legal requirements in the treatment of occupational injuries and illness to aid in preventing disease and injury, to promote better employee health, and to rehabilitate the injured, both physically and vocationally.

There are chapters on setting up plant medical facilities, on the functions of the industrial physician and the industrial nurse, and importantly on rehabilitation. The last-named chapter makes a strong point for using the many qualified rehabilitation centers in the county. Aetna pioneered among insurance companies in having set up and supported a rehabilitation center in Syracuse from 1920 to 1941. It now uses other centers and makes available to its policy holders a list of qualified ones.

The manual is not for public distribution, but it may well be useful for local health officials to know that this service is available to local Aetna policy holders and thus find means of cooperating with the local industry and the claims representative in the medical service of the industry. The medical director of Aetna is Kenneth Brandon, M.D., a member of the Epidemiology Section of the American Public Health Association.

Accident Prevention Program Data

In preparation for carrying out a charge from Governor Clement to organize a home accident prevention program for the state, the Tennessee Department of Health has published "Home and Farm Accidental Deaths." The data are totaled and in most instances averaged for the five-year period 1953-1957. In

that period accidents were the chief cause of death for all age groups under 45, the fourth cause in importance for the group 45-64, and the sixth for those 65 or over. More than a fourth of all deaths due to accidents were due to home accidents.

Except through a single table and illustrative map showing average annual death rates from home accidents per 100,000 population, no data are shown for counties or smaller political subdivisions. Nor are the figures shown for the separate years to indicate possible trends. Were there some of this material as well as somewhat more interpretive text, the attractively produced booklet would be of even more "help to local health departments, other official agencies, voluntary agencies, organizations, clubs, and schools in stimulating their members to take action on reducing the home accident problem."

R. H. Hutcheson, M.D., is the Tennessee state health officer, Nashville. His foreword does not say so, but he might be willing to share this pamphlet with others interested in developing a similar prevention program.

Feelings and Health

The Ross Laboratories has begun to publish "Feelings and Their Medical Significance," described as "a series of newsletters on the behavioral disorders afflicting many young patients" and believed "of interest to physicians. . . . Each issue will deal with clinical problems commonly encountered in general and pediatric practice, with discussion of their management and disposition." The editor is W. Hugh Missildine, M.D., director of the Children's Health Center, Columbus, Ohio.

Also recently published by the Ross Laboratories is "Physical and Behavioral Growth." This is the report of the 26th Ross Pediatric Research Conference which was held under the auspices of the Department of Pediatrics, University of California School of Medicine, in October, 1957. The reprints of the 27th and 28th conferences are also now available. Their subjects are respectively, "Nonoperative Aspects of Pediatric Surgery" and "The Child at Law." The Ross Pediatric Laboratories (SIMILAC) Columbus 16, Ohio.

Training Manual on Swimming Pools

"Swimming Pools—Disease Control Through Proper Design and Operation" is a training and reference guide for public health personnel and operators and owners of swimming pools who are conducting inservice training programs in the operation of pools. In its 150 pages are lecture outlines covering general discussions of swimming pool sanitation and its relationship to disease transmission; construction, operation, and maintenance; and water testing and inspection of installations. Illustrative problems to be used in connection with the various lessons, a recommended training course outline, pool layout illustrations and six suggested record forms complete the manual.

Jerrold M. Michael, sanitary engineer, Environmental Health Training Section developed the manual. Available without charge to personnel planning swimming pool instruction courses from: Training Branch, Communicable Disease Center, Public Health Service, Atlanta, Ga.

Annual Reports

"The Rockefeller Foundation Annual Report, 1957," as one has come to expect from the reports of this foundation, is in effect a summary of what goes on in medical education and public health, in biological and medical research, in agriculture, in the social sciences, and in the humanities, as they affect "the well-being of mankind throughout the world" (the legend on the foundation's seal).

Particularly notable is the five-page summary of "public health aspects of nuclear energy." This states the problem and summarizes some of the separate ways in which universities are throwing light on it.

In outlining the task of a university in this area the report says, "A new kind of health expert is required, one whose training encompasses a far broader scientific area than heretofore, and who has an adequate understanding of the very important social, economic, and legal factors that enter into his problem." The report further states, "Practical training which can be acquired in industry . . . cannot produce the type of highly qualified expert who can bridge the gap between the conventional public health area and that of the engineers, physicists, and chemists, and can assist in charting, in their earlier phases, the directions which nuclear development must take."

The foundation is supporting broad programs of training in these fields at the Harvard University School of Public Health, at the Graduate School of Public Health of the University of Pittsburgh, at the Department of Biophysics at the Johns Hopkins University with one of its divisions in the School of Hygiene and Public Health. To each of these the foundation has given half a million dollars for the development of these programs with somewhat divergent approaches.

The rationale of the $150,000 three-year development grant to the American Public Health Association is also succintly stated. "To deal more vigorously with present-day challenges in public health, the Association plans to reorganize its structure, establishing several new standing committees and adding to its staff. . . ." Specially mentioned are expanded activities in accident prevention, control of environmental hazards, medical care, recruitment and training, mental health, and chronic disease.

Nor are these the only matters in the report of interest to the public health profession. Much that is in it will help to raise the sights and stretch the minds of public health workers.

John C. Bugher, M.D., is director of medical education and public health; Warren Weaver, Ph.D., is vice-president for the natural and medical sciences; and Dean Rusk, LL.D., is president of the foundation. 49 West 49th St., New York, N. Y.

"Examine the Facts" is the 23rd biennial report of the South Dakota Department of Health for the years 1956-1958. In a well produced volume in blue and white, it attempts to answer for citizens of the state the questions "What is public health?" and "What do public health workers do in the department?"

For each of 16 divisions and sections, signed by the director, is an outline of the responsibility, the accomplishments, what it would like to do, and what it has been up against during the biennium. For each there are simple drawings, charts, or photographs.

G. J. Van Heuvelen, M.D., is the state health officer, Pierre.

"Memorial Center 1956-1958" is the biennial report of the three institutions that together make up a vast integrated cancer prevention, treatment, and research center in New York City. These are the Memorial Center for Cancer and Allied Diseases, first organized as Memorial Hospital in 1884; the Sloan-Kettering Research Institute, which began operation in 1948; and the municipal James Ewing Hospital, only slightly younger.

The report stresses treatment, research, teaching, and recovery. The research is underlined by an 18-page listing of staff publications during the two-year period. The report tells not

only what goes on in this center, but is in effect a report of where we currently are in the fight against cancer.

The report is beautifully produced using color, photography, printing, and paper effectively for attention appeal. The Sloan-Kettering report is also separately printed. Memorial Center for Cancer and Allied Diseases, 444 E. 68th St., New York 21, N. Y.

Worth Acquiring

"Current Nutrition: A Bibliography and Review" is the product of a community nutrition activity promoted jointly by the Health Education Committee of the Community Welfare Council and the Milwaukee Dietetic Association. This annotated bibliography includes a selected list of books published since 1950, intended for the use of health workers, home economists, and librarians.

The 62 books are classified in eight categories for each of which some of the recommendations are "optional." Since the "science of nutrition is dynamic, and both scientific and practical concepts will change," it is planned to revise the bibliography periodically. In the interim the nutrition section of the council will review new publications and send to those having the present booklet additional pertinent data. Room has been left under each subject in the pamphlet for adding the new data.

Jean Hankin, public health nutritionist of the Milwaukee Health Department, is chairman of the Community Nutrition Library Project. Copies have been distributed to librarians, health workers, and home economics teachers in Milwaukee County and to relevant national and state organizations. Others may be obtained from Community Welfare Council of Milwaukee County, 606 E. Wisconsin Ave., Milwaukee 2, Wis.; 25 cents.

"Your Gifted Child" is the newest addition to the Children's Bureau publications for parents. It suggests to both parents and professions serving children that long-range planning for gifted children should begin early in their formative years. Making the most of their abilities without setting them apart, seeing that they get the education of which they are capable, stimulating them to develop their own potentialities, and avoiding oversupervision and overprotection are some of the guiding principles.

Before publication of the pamphlet, it was reviewed by more than 100 persons, among them representatives of the National Association of Gifted Children, the Association for Childhood Education, and the U. S. Office of Education. Government Printing Office, Washington, D. C.; 20 cents.

"The Many Faces of Money" is one of the "human relations' aids" being distributed by the Mental Health Materials Center. It is designed, according to the center, "to help people of all ages understand the reasons for their attitudes and behavior regarding money and to help them plan better for its use." It deals particularly with the family problems that revolve—or more often seem to revolve—around money. Why people spend recklessly, or hoard, what money means to the young person with his first pay check, to the young married couple, the couple with growing children, and to older persons are discussed in their psychological background.

Author is Edith G. Neisser, writer on family life. Among those who reviewed the manuscript is Nina Ridenour, Ph.D., secretary of the Ittleson Family Foundation.

Mental Health Materials Center, 104 E. 25th St., New York 10, N. Y.; 25 cents, reductions for quantity orders.

NEWS FROM THE FIELD

WHO News

$8 Million Malaria Fund

With the recent contribution of $3 million by the United States and $23,250 by Switzerland, the WHO fund for the campaign of world-wide eradication of malaria has now reached $8,227,000 of the estimated $50 million needed. Of the total, $8 million has been contributed by the United States. The next largest contributor is the Federal Republic of Germany with $95,200. Turkey, Italy, Iraq, and Portugal are other countries that have contributed $10,000 or more. In addition to the United States contribution to WHO, the United States has also contributed $6.5 million to the Pan-American Sanitary Bureau for the malaria eradication program in the Americas.

At a recent meeting of the WHO Executive Board, Director-General M. G. Candau, M.D., indicated that the eradication campaign was threatened by a serious shortage of funds and that it was an unsound situation for the World Malaria Fund to depend almost entirely on the support of a single country. He reported a shortage of more than a million and a quarter of the amount needed for 1959. The assistant director-general, Dr. P. M. Kaul, said that if funds necessary to continue the cooperative effort were not provided, programs in some countries would collapse and the money already spent would be wasted. The matter has been referred to the Executive Board's Standing Committee on Administration and Finance.

WHO to Expand Its Medical Research

The Executive Board of WHO, meeting in Geneva in January, unanimously endorsed a program for extended medical research as suggested by Director-General M. G. Candau, M.D. As a result of the discussions, Dr. Candau was directed to submit his proposed research program with budget estimates, to the 12th World Health Assembly which meets in Geneva in May.

Among those taking part in the discussions was Dr. L. T. Coggeshall, dean, Division of Biological Sciences, University of Chicago. He reminded the board that along with the new problems constantly appearing, many old problems were still unsolved. Professor E. A. Aujaleu, director-general of public health, French Ministry of Health, pleaded for the widest possible interpertation of medical research, taking into account the population at large, as well as the patient, the hospital, and the laboratory.

Dr. Candau's research report cited six areas of commanding attention. These are problems of world-wide significance, such as genetic description of populations and measuring the incidence and prevalence of disease: communicable diseases that require a regional approach; certain chronic diseases to the understanding of which a comparison of health and illness in different environments and economic conditions may provide the key; rare conditions that may develop practical importance; assisting research workers to combine their experience for expeditious solution of problems; cooperation in making research resources available to countries that lack them.

Air Pollution Can Be Controlled

The administration of a control program must be based upon the concept that clean air is attainable to the extent that the community concerned is willing to pay for it. This is one of the conclusions implied in its first report on air pollution of WHO's Expert Committee on Environmental Sanitation. Standardization of sampling technics, procedures,

and terminology, further research, collection and distribution of information including cost of air pollution, training of special personnel, and public education as to the problem were other recommendations.

Fifth Report, WHO Expert Committee on Environmental Sanitation (Air Pollution) Technical Report Series 1958, No. 157, Columbia University Press, 2960 Broadway, New York 27. Also available in French and Spanish.

Soper International Health Lectures

In honor of retiring Director Fred L. Soper, M.D., the staff of the Pan American Sanitary Bureau has established the Fred L. Soper Lectures in International Health, with voluntary contributions to a special fund. The plan is for five lectures in successive years by outstanding, leading public health scientists in schools of public health in the United States, Brazil, Canada, Chile, and Mexico. The lecturers are to be chosen by the host university and a committee of PASB. The purpose is to bring public health students into contact with outstanding scientific health authorities.

The first lecture is to be given by Dr. Soper himself this fall at the Johns Hopkins School of Hygiene and Public Health, from which he received his Doctorate in Public Health in 1925.

Is Plague Disappearing?

In a recent Weekly Epidemiological Record, WHO reported that in 1958 only 213 cases of plague were officially recorded. This represents the lowest number since the beginning of the century and less than half the 1957 total. As recently as 1951, 15,400 cases were reported, of which more than one-half were in India. Of the 1958 cases only 26 were reported in India.

What Is Engineering?

"Engineering" is described by the Recognition Committee of the Engineers' Council for Professional Development as "The profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the progressive well-being of mankind." This definition is presented in the 26th Annual Report of the council. Comments as to its adequacy are invited. Among other committee reports of particular interest is that of the Student Development Committee, which as a special project during the past year studied the motivation of those wishing to become engineers.

Once again one of the values of the report is that in it are listed the engineering schools by type of curricula accredited by the council. A total of 154 schools are accredited for 839 curricula. As in 1957, full curricula in sanitary engineering were accredited for three engineering schools—the University of Illinois, Pennsylvania State University, and Rutgers University. Sanitary options in civil engineering curricula were accredited in 26 other institutions. The ECPD is at 33 West 39th Street, New York 18, N. Y.

Reaffirms County Health Support

The House of Delegates of the Medical Society of the State of Pennsylvania has again reaffirmed its support of the development of county health departments in that state. At the 18th annual meeting of the society in October, 1958, it was resolved "That the House of Delegates of the Medical Society of the State of Pennsylvania, reaffirms the endorsement of the establishment of county health departments in Pennsylvania and pledges its continued leadership and assistance to county medical societies in their efforts to improve their local health services through the creation of county health departments as the most economi-

cal and adequate means of providing improved and more effective services to the citizens."

The Medical Society was active in the early movement that led to the 1948 state health study, the new state public health law authorizing county or multi-county health departments, the support of a merit system for the department, among other developments of the past decade. Its constituent county societies have given active leadership in counties that have had health surveys and committees for the development of local official community health services such as in Allegheny, Erie, and Bucks County. Pascal F. Lucchesi, M.D., medical director, Albert Einstein Medical Center, has been the chairman of the society's Committee on Preventive Medicine and Public Health throughout this period.

Harvard Fund Honors Dr. Hamilton

Alice Hamilton, M.D., was honored on her 90th birthday by the creation at the Harvard School of Public Health of a fund bearing her name. Dr. Hamilton is considered the founder of the profession of occupational medicine. She is assistant professor of industrial medicine, emerita, in the Harvard school where she served from 1919 until her retirement in 1935.

The fund was made possible by contributions from friends, admirers, and former colleagues and students. It will be used for purposes in keeping with Dr. Hamilton's interests and high achievement in occupational medicine. Among these purposes are scholarships and honoraria for lectures. Eventually, it is hoped to endow a chair in occupational medicine.

Dr. Hamilton was an American Public Health Association Lasker Award winner in 1947. In 1956 she was named Medical Woman of the Year by the Boston Chapter of the American Medical Women's Association. In 1958 she was one of seven professors emeriti of the Harvard School of Public Health honored by the faculty in special ceremonies. Dr. Hamilton is a Fellow of the American Public Health Association.

Jaycee's 10 Young Men of the Year

Among the 10 young men cited by the Junior Chamber of Commerce as outstanding are three physicians. One is James T. Grace, Jr., chief cancer research surgeon, Roswell Park Memorial Institute at Buffalo, which is a facility of the New York State Health Department. The others are Richard T. Smith, professor of pediatrics, University of Florida College of Medicine, for his work in the field of infections, diseases, and immunity, and Hugh E. Wilson III, surgeon of Dallas, who has established a cardiac research laboratory at the University of Texas Southwestern Medical School.

Others cited included a nuclear physicist, college professors, a judge, an editor, a naval officer, and a musician.

Fluoridation Pays in Philadelphia

The Philadelphia Inquirer, in an editorial, discusses the city health department's report on the results of a four-year experience with fluoridation. The city, the first with a population in excess of two million to introduce sodium fluoride into its water supply, reports a 50 per cent decrease in tooth decay among six-year-old children. The findings are based on a study of nearly 18,000 children during the school year 1954-1955. The Inquirer points out that "parents of teenage school children should be happy. The dental bills of their offspring should show a decrease of something like 50 per cent."

The results of a related study in New Jersey are printed in the December, 1958, issue of "Public Health News" of the State Health Department. Here,

William H. Aaroe, principal public health engineer of the department's radiological health program, demolishes two claims of the antifluoridationists. One is that present feed machines and engineering methods are unable to maintain accurate, precise fluoridation levels in water; second, fluorides tend to be deposited inside the distribution system and are periodically released in heavy concentrations. His findings are based on a tri-weekly analysis, over a six-month period, of the fluoridated water supply of the city of Rahway.

Mental Health Week—April 26-May 2

Mental Health Week is jointly sponsored annually by the National Association for Mental Health, its 43 state associations, and the National Institute of Mental Health. The week is designed to recreate public awareness of and interest in mental health problems and activities. The 1959 week, April 26-May 2, will center around "Operation Friendship." In this new project the association hopes to recruit 750,000 volunteer visitors to mental hospitals—"one visitor from the outside for every patient on the inside." Its purpose is to show patients that people "really care," to give people a better understanding of mental hospitals and mental health problems, and to promote closer relations between the community and the hospital. NAMH hopes to have the cooperation of state and local affiliates of other national health agencies in developing this corps of volunteers. Further information from National Association for Mental Health, 10 Columbus Circle, New York 19, N. Y.

Progress on Ruth Hubbard Foundation

The present chairman of the Ruth Weaver Hubbard Foundation is Madelyn N. Hall, R.N., director of the Division of Nursing, Philadelphia Health Department. Since the foundation was incorporated in mid-1956 as a scholarship fund for nurses, the late Miss Hubbard's friends and colleagues have raised $10,000. Their goal is $15,000 in order to provide at least one annual scholarship of $500 for graduate study in the School of Nursing, University of Pennsylvania.

At the time of her death, Miss Hubbard was director of the Philadelphia Visiting Nurse Society which took the leadership in organizing the fund in her memory (see A.J.P.H. 46, 10:1371 (Oct.), 1956).

Contributions to complete the goal of the fund may be sent to Ruth Weaver Hubbard Foundation, Visiting Nurse Society of Philadelphia, 1340 Lombard St., Philadelphia 47, Pa.

Blackwell Citation to Two Doctors

The 1958 Elizabeth Blackwell Awards for distinguished contributions to medicine were recently presented by the New York Infirmary at a ceremony in New York City. Katharine Dodd, M.D., distinguished professor of pediatrics, University of Louisville School of Medicine, was cited for achievements as "physician, investigator, and teacher in pediatrics." Dr. Dodd is a member of the American Public Health Association.

Marian Wilkins Ropes, M.D., assistant clinical professor, Harvard Medical School, was cited for "research and teaching of internal medicine."

Thomas K. Finletter, former secretary of the Air Force, was the speaker on the occasion of the presentation ceremonies.

Nation's 400,000 Nursing Home Beds

The Social Legislation Information Service reprints from the American Nursing Home Association Survey a table showing state by state distribution of nursing and convalescent homes in the United States. This shows nearly

400,000 beds in 17,455 proprietary and nonprofit homes and city, county, and state institutions. California and Pennsylvania each have slightly more than 10 per cent of the beds. New York has nearly 34,000, Illinois nearly 25,000, and Ohio just under 20,000. Social Legislation Information Service, Issue No. 5, 86th Congress, February 16, 1959. 1346 Connecticut Avenue, N.W., Washington 6, D. C.

To Assist Researchers in Alaska

An Interagency Research Advisory Committee has been formed by representatives of the Alaska Department of Health, Alaska Native Health Service, and Arctic Health Research Center of the Public Health Service and Arctic Aeromedical Laboratory of the Air Force to assist scientific investigators in medical and allied fields wishing to carry on research in Alaska. To assist investigators sponsored by a recognized institution the committee is prepared to explain local situations, to meet logistic difficulties, and to make available Alaskan facilities. Such assistance should be requested from E. M. Scott, Chairman, Interagency Research Advisory Committee, Arctic Health Research Center, Box 960, Anchorage, Alaska.

CDC Films Available

"Health Hazards of Pesticides (M-204)" and "Off-Site Monitoring of Fallout from Nuclear Tests (M-309)" are the titles of two 16mm color, sound films available from the Communicable Disease Center. The former, 14½ minutes, is aimed at public health personnel engaged in toxicology work; operators of spray and dusting equipment; farmers and fruit growers. It emphasizes the potential public health hazards resulting from the widespread use of pesticides and makes recommendations for their safe use.

The second, 29 minutes, is designed for public health personnel and others concerned with the effects of nuclear fallout. It shows the radiological safety activities of the Service in the off-site area of the AEC test site in Nevada.

Both films may be obtained on a short-term loan from Chief, Communicable Disease Center, P. O. Box 185, Chamblee, Ga. Purchase from United World Films, 1445 Park Avenue, New York 29, N. Y.

Student Nursing Recruits Gaining

A 5 per cent increase in students entering basic professional nursing schools in 1958 is reported by the Committee on Careers of the National League for Nursing. The figures for 1958 are 46,600; for 1957, 44,300. This rise is being credited by the chairman of the committee, John H. Hayes, to two factors. A 4 per cent rise in 17-year-old girls in the population was a "beginning upturn" in 1958. The second influence is the active nursing careers information program in every state, often reinforced by city, county, and area nursing recruitment.

Simultaneously with the rise in professional nursing students there has been an estimated increase of 20 per cent of those who began practical nurse training in the 587 schools offering such training. Approximately 20,000 persons were being trained in these schools in 1958.

Training Opportunities

Maryland's Institute of Acarology

The Institute of Acarology, University of Maryland, is offering three courses in the 1959 Summer Session, June 22-July 31. This program provides an opportunity for entomologists, parasitologists, zoologists, and advanced biology

students to study the mites and ticks. The recent important discoveries of the role of the Acarina in public health and agriculture emphasize the need for understanding all phases of knowledge about them, particularly in the epidemiology of the encephalitides, scrub typhus, "Q" fever, haemorrhagic fever, and other diseases. Further, their increased destruction of plants, following the introduction of the newer insecticides, makes their study increasingly important to biologists.

A number of stipends of $150 each for applicants from North America are available to students through training grants from the National Institutes of Health.

Further information and application blanks for admission and for the training stipends from Mrs. Allie M. Brown, Department of Zoology, University of Maryland, College Park, Md.

Institute in Social Gerontology

A second summer Training Institute in Social Gerontology is to be held at the University of California, August 3-29, 1959. The Training Institute is given with the help of a grant from the National Institutes of Health by the Inter-University Council made up of 16 universities from California to Connecticut and Florida to Minnesota. The program is open to college faculty trained in one of the social sciences or related professional fields (public health, social work, education, nursing, and developing gerontology courses and training programs in these institutions).

Some Fellowships are available. These cover transportation, living costs, and a $500 stipend. Application for admission and Fellowship and other information should be made to: Dr. Wilma Donahue, Director, Institute of Social Gerontology, 1510 Rackham Building, University of Michigan, Ann Arbor, Mich.

Chronic Illness Nursing

Yale University Department of Public Health announces a 1959-1960 graduate program in supervision, education, and consultation in chronic illness nursing. The curriculum provides an opportunity to acquire a broader understanding of community organization, problems, and public health practices with special emphasis on chronic illness nursing.

The new program is designed for the public health nurse who is preparing for consultant or supervisory responsibilities and desires emphasis on chronic illness; and for the nurse educator and supervisor who desires the combined approach of public health and chronic illness nursing in her teaching and clinical supervision.

Additional information and application forms from Dr. Edward M. Cohart, Yale University Department of Public Health, 310 Cedar Street, New Haven 11, Conn.

Public Health Nutrition Today

"Nutrition, Yesterday and Today" is the opening theme of the 13th annual Summer Community Nutrition Institute at Syracuse University, June 15-26. Later sessions will deal with recommended dietary allowances, mineral and trace elements and lipid metabolism, and food practices of the American public. In the second week will be discussed the methods used and problems involved in epidemiologic studies in which nutrition as an environmental factor is being investigated. Leading these discussions will be clinician, epidemiologist, statistician, anthropologist, and nutritionist.

The program is directed jointly by the Syracuse College of Home Economics and the Bureau of Nutrition of the New York State Department of Health. Three hours of graduate credit may be earned. Fee for the course is $96.

Further information and application

blanks from Dr. Anne Bourquin, College of Home Economics, Syracuse University, Syracuse 10, N. Y.

Course in Neuromuscular Diseases

An intensive course in Neuromuscular Diseases of Children, with special emphasis on cerebral palsy, will be given at the Cook County Graduate School of Medicine, led by Meyer A. Perlstein, M.D., June 15-26. This is designed for pediatricians, orthopedists, neurologists, psychiatrists, and physiatrists interested in the care and treatment of children with neuromuscular handicaps. Practical clinical aspects of treatment and rehabilitation procedures and trips to demonstration clinics and treatment centers will be included. The $250 fee includes the cost of transportation and necessary accommodations during field trips. Registration is limited. Further information from John W. Neal, Registrar, Cook County Graduate School of Medicine, 707 S. Wood St., Chicago, Ill.

Cornell's Human Ecology Program

Three two-year fellowships for a new Human Ecology Study Program at the Cornell University Medical College are available for those interested in the study of human ecology and its relation to health. The course is designed for those who plan to pursue academic careers. The program's scope covers three general areas, the social and physical milieu in which men live and its specific aspects that affect health and behavior; the interaction between human beings and their milieu; and the interaction between bodily processes and the highest integrative activities of the brain. The staff, headed by Harold G. Wolff, M.D., and his associate, Lawrence E. Hinkle, Jr., M.D., will include representatives from internal medicine, psychiatry, neurology, psychology, sociology, and cultural anthropology.

A grant from the estate of Anne Parrish Titzell makes the fellowships possible. Stipends are $4,500 for the first year, $5,000 for the second, with an allowance of $500 per dependent. Applicants should have completed a year of graduate training in public health, preventive medicine, or one of the fields mentioned earlier.

Applications should be made to Dr. E. Hugh Luckey, Chairman, Department of Medicine, New York Hospital-Cornell Medical Center, 525 East 68th Street, New York 21, N. Y.

Delaware County Prepares for Survey

The Health and Welfare Council of Delaware County (Pa.) has agreed, at the request of the County Medical Society, to undertake a thorough health survey of this county of more than 400,000 population. There has been no such survey for more than a quarter of a century. In the meantime, 75 official health agencies "heterogeneous as to kind, quantity and effectiveness" have grown up with no coordinated pattern of operation or cooperation.

The County Medical Society, through the chairman of its Committee on Preventive Medicine and Public Health, is arranging for citizens' committees, raising funds, and obtaining staff and public health consultants. The state society's Educational and Scientific Trust has made a grant of funds for the two consultants who have been retained. They are Roscoe P. Kandle, M.D., deputy health commissioner, New York City, and Hugh D. Palmer, M.D., health officer of the Southeastern State Health District, New Jersey Department of Health.

PERSONALS

JOHN B. BARNWELL, M.D.,† assistant chief medical director for research and education, Veterans Administration, has received one of the Fifth Annual Career Service

† Member.

Awards of the National Civil Service League as one of the ten top career men in the federal government because of his competence, efficiency, character, and continuity of service.

GOLDIE B. BARTHOLOMEW, R.N.,† former executive secretary, Carbon County (Pa.) Tuberculosis and Public Health Society, has resigned and been succeeded by GEORGE D. AUBREY.

ROBERT BOGGS, M.D., of Robert Boggs Associates, chairman, National Committee for Resettlement of Foreign Physicians, and member, Medical Advisory, Unitarian Service Committee, has been appointed also director of the Basic Medical Research Program, National Fund for Medical Education, a program supported by funds raised by local affiliates of the United Community Funds and Councils of America.

A. JUNE BRICKER,* former head, Home Economics Bureau, Metropolitan Life Insurance Company, has been promoted to director of field and community health.

DOUGLAS H. BROWN, M.D., former deputy commissioner of health, Westchester County (N.Y.), has succeeded EDWARD W. COLBY, M.D., M.P.H.,* as health officer of Portland, Maine.

RAY K. BROWN, Ph.D., former assistant director, Laboratories for Biochemistry and Immunology, has been appointed associate director, Division of Laboratories and Research, New York State Health Department.

ALFRED J. CROWLE, research microbiologist, Colorado Foundation for Research in Tuberculosis, has been named 1959 recipient of the Dr. James Alexander Miller fellowship of the New York Tuberculosis and Health Association to continue his quest for a completely effective antituberculosis vaccine.

JOSEPH J. DOWNING, M.D.,* former acting director, Mental Health Research Unit, New York State Department of Mental Hygiene, has been appointed program chief, Mental Health Services, San Mateo County (Calif.), Department of Health and Welfare.

BERNICE ELLIOTT has retired as editor, Publications Unit, National Tuberculosis Association, and the unit has been transferred from the Executive Office to the Health Education Division. JOAN WELSH, former assistant editor, Reinhold Publishing Corporation, New York City, has succeeded Miss Elliott. Miss Elliott begins her retirement with an extended trip to Europe.

* Fellow.
† Member.

MILTON GEYER, former public health education consultant, and recently acting director, has been appointed director, Bureau of Public Health Education, Connecticut State Department of Health.

LEONARD J. GOLDWATER, M.D., Sc.D.,* professor of occupational medicine, Columbia University School of Public Health and Administrative Medicine, is president, American Academy of Occupational Medicine, succeeding RONALD F. BUCHAN, M.D.,† director of employee health, Prudential Life Insurance Company.

LT. COMMANDER DONALD R. GOODEN, USN (Rtd.), R.S.,† former head of the Environmental Health Section, Bureau of Medicine and Surgery, is now assistant to the chief of environmental health, Allegheny County Health Department.

L. M. GRAVES, M.D.,* director, Memphis and Shelby County (Tenn.) Health Department, has been honored as the "Man Of The Year" by the Memphis Civitan Club.

DOLPH HESS, former psychiatric social worker, Nebraska Psychiatric Institute, Scottsbluff, is now psychiatric social consultant, Wyoming State Health Department, succeeding WILLIAM T. HALL, on educational leave at the University of Minnesota.

JAMES B. JOHNSON, following two years' service with the U. S. Army in Korea and Japan, is now director of publications, Indiana Tuberculosis Association.

PETER N. KESSLER, M.D., M.P.H.,† former medical officer, Firestone Plantations Company, Liberia, is now medical director, Lamco, Monrovia, Liberia.

ELIZABETH KING, former social worker, Duke University Medical Center, is now medical social worker, Crippled Children Division, South Carolina State Board of Health.

HELEN M. KLIEFORTH, former public relations director, United Community Chest of Madison, Wis., has been named director, Magazine Services, United Community Funds and Councils of America, New York City.

HENRY W. KOLBE, M.D.,* former director, Bureau of Medical and Hospital Services, New York City Department of Hospitals, has become executive director, Philadelphia General Hospital.

JAMES C. LAMB III, Sc.D., a faculty member, Newark (N.J.) College of Engineering, has been appointed associate professor, Department of Sanitary Engineering, University of North Carolina School of Public Health.

GEORGE M. MCMARTIN, hospital administration consultant, South Carolina State Board of Health, has resigned in order to accept a U. S. Army commission. He has been

assigned to the Army Medical Service School, Brooks Army Medical Center, Fort Sam Houston, Tex., with the rank of Captain.

J. P. OWENS, M.D.,† former Hamilton County health officer, has succeeded ROBERT A. VOGEL, M.D.,† as health officer of the four-county health department for Delaware, Madison, Morrow, and Union Counties, with headquarters in Delaware, Ohio.

WALTER S. PAGE, JR.,† executive director, Ohio Heart Association, is president of the national Staff Conference of Heart Associations, American Heart Association.

COLONEL THOMAS E. PATTON, JR., M.D.,* former chief, Medical Intelligence Division, Army Surgeon General's Office in Washington, D. C., has been assigned Commanding Officer, U. S. Army Hospital and Post Surgeon, Fort Lawton, Wash.

SARTO R. PLAMONDON,* former air pollution control engineer, Montreal, Canada, is now a WHO adviser assigned as professor of industrial health engineering, Hughes Institute of Public Health, Alexandria, Egypt. His address is c/o EMRO World Health Organization P.O.B. 1517, Alexandria, U.A.R.

ANN POLLOCK, R.N., M.P.H.,* former director, Spokane Visiting Nurse-City Health Department Nursing Service, is now public health nursing education consultant, San Diego (Calif.) Department of Public Health.

MARGUERITE J. QUENEAU,* associate nutritionist, Bureau of Nutrition, New York State Health Department, has retired.

HENRY H. SMACH, Ph.D.,† is bioanalyst and clinical chemist, and assistant director, Clinical Laboratory, Elgin State Hospital, Elgin, Ill.

J. EARL SMITH, M.D.,* former director, Division of Health, St. Louis Department of Public Welfare, has been appointed director of the newly created Department of Health and Hospitals. Consolidation of the two departments was one of the recommendations of the St. Louis study made by the American Public Health Association.

RALPH M. SOULE, former associate sanitary engineer in charge of the Water Supply Section, has been appointed director and chief sanitary engineer, Division of Sanitary Engineering, Massachusetts State Health Department, succeeding CLARENCE I. STERLING, JR.,* now director and chief engineer, Massachusetts Water Resources Commission.

WILLIAM C. SPRING, JR., M.D., M.P.H.,* former professor of public health practice, Columbia University School of Public Health and Administrative Medicine, is now associate medical director, J. B. Roerig and Company, Pharmaceutical Division of Chas. Pfizer and Company, New York City.

EDWIN T. TRACY, former acting director, has been appointed director, Bureau of Vital Statistics, Connecticut State Department of Health.

MELVIN M. UDEL, M.D.,† formerly in the Department of Occupational Medicine, Columbia University School of Public Health and Administrative Medicine, has been appointed director of safety and occupational health, Metropolitan Life Insurance Company.

JOHN J. UNTEREKER, M.D., clinical instructor in physical medicine and rehabilitation, New York University-Bellevue Medical Center, has been named also director, Medical Service, Institute for the Crippled and Disabled, New York City.

MYRON E. WEGMAN, M.D., M.P.H.,* secretary general, Pan American Sanitary Bureau, has received the 1958 Clifford G. Grulee Award of the American Academy of Pediatrics for outstanding service to pediatrics.

WILLIAM P. YANT, Sc.D.,* former director of research and development at Mine Safety Appliances Company, has been appointed chairman, Board of Trustees, Industrial Hygiene Foundation.

FRANKLIN D. YODER, M.D., M.P.H.,* health officer of Wyoming, has been appointed director, Division of Socio-Economic Activities, American Medical Association, on a part-time basis until July 1 when he will leave Wyoming for full-time service. The division under Dr. Yoder's supervision includes the Bureau of Health Education, the Economic Research Department, the four Councils on Industrial Health, National Defense, Medical Service, and Rural Health, and the medical representatives at Washington, D. C.

* Fellow.
† Member.

CONFERENCES AND DATES

American Public Health Association, Eighty-Seventh Annual Meeting, Atlantic City, N. J., October 19-23.

State and Regional Public Health Meetings—April, May, and June:

Arizona Public Health Association. Tucson. April 24.

Arkansas Public Health Association. Marion Hotel, Little Rock. April 29-30.

California Public Health Association, Northern. Palo Alto. May 1.

Colorado Public Health Association. Stanley Hotel, Estes Park. June 11-12.

Connecticut Public Health Association. University of Connecticut, Storrs. April 21.

Georgia Public Health Association. De-Soto Hotel, Savannah. May 10-13.

Idaho Public Health Association. Shore Lodge, McCall. May 8-9.

Illinois Public Health Association. Morrison Hotel, Chicago. April 9-11.

Indiana Public Health Association. State Board of Health. Indianapolis. May 7-8.

Iowa Public Health Association (with Middle States). Savery Hotel, Des Moines. April 1-3.

Kansas Public Health Association. Baker Hotel, Hutchinson. April 22-24.

Louisiana Public Health Association. Capitol House, Baton Rouge. April 9-10.

Michigan Public Health Association. Pantlind Hotel, Grand Rapids. May 13.

Missouri Public Health Association. Hotel Statler, St. Louis. May 18-20.

New Mexico Public Health Association. Albuquerque. April 6-8.

New York State Public Health Association. Lake Placid. May 25-28.

North Dakota Public Health Association. City Armory, Grand Forks. April 6-7.

Middle States Public Health Association (with Iowa Public Health Assn.). Savery Hotel, Des Moines, Iowa. April 1-3.

Southern Branch, APHA. McAllister Hotel, Miami, Fla. May 27-29.

West Virginia Public Health Association. Daniel Boone Hotel, Charleston. June 11-13.

Western Branch, APHA. Sheraton-Palace Hotel, San Francisco. June 1-5.

Meetings of Other Organizations:

Aero Medical Association. Statler Hotel, Los Angeles, Calif. April 27-29.

Air Pollution Control Association. Hotel Statler, Los Angeles, Calif. June 22-26.

American Council to Improve Our Neighborhoods, Inc. Newark, N. J. May 4-6.

American Diabetes Association. Chalfonte-Haddon Hall, Atlantic City, N. J. June 6-7.

American Hearing Society. Fountainbleau Hotel, Miami Beach, Fla. June 8-11.

American Home Economics Association. Milwaukee, Wis. June 23-26.

American Medical Association. Traymore Hotel, Atlantic City, N. J. June 8-12.

American National Red Cross. Convention Hall, Atlantic City, N. J. June 1-3.

American Physical Therapy Association. Hotel Leamington, Minneapolis, Minn. June 21-26.

American Psychiatric Association. Philadelphia, Pa. April 27-May 1.

American Social Hygiene Association New York, N. Y. May 11.

American Society for Public Administration. Hotel Statler, Washington, D. C. April 1-5.

American Society of Medical Technologists. Hotel Westward Ho, Phoenix, Ariz. June 14-19.

American Society of Planning Officials. Leamington Hotel, Minneapolis, Minn. May 10-14.

Association for the Aid of Crippled Children. New York, N. Y. April 28.

Canadian Public Health Association with the Society of Hygiene and Preventive Medicine of the Province of Quebec (50th Anniversary Meeting). Sheraton-Mount Royal Hotel, Montreal, Que. May 31-June 3.

Eastern States Health Education Conference. New York Academy of Medicine, New York, N. Y. April 30-May 1.

Goodwill Industries of America. Detroit, Mich. June 25-28.

Health Physics Society. Gatlinburg, Tenn. June 18-20.

Industrial Health Conference. Hotel Sherman, Chicago, Ill. April 25-May 1.

Inter-American Conference on Rehabilitation (Fourth). San Juan, Puerto Rico. May 20-23.

International Conference on Health Education (Fourth). Dusseldorf, Germany. May 2-9.

International Congress of International Academy of Legal Medicine and Social Medicine. Madrid, Spain. April 16-19.

National Association for Practical Nurse Education. Netherlands-Hilton Hotel. Cincinnati, Ohio. April 27-May 1.

National Association of Sanitarians. Deauville Hotel, Miami Beach, Fla. June 22-26.

National Association of Social Workers (in conjunction with National Conference on Social Welfare). San Francisco, Calif. May 24-29.

National Citizens Committee for the World Health Organization — Second National Conference on World Health. Statler-Hilton, Washington, D. C. May 7-9.

National Committee on the Aging—NSWA. St. Louis, Mo. April 15-17.

National Conference on Social Welfare. San Francisco, Calif. May 24-29.
National League for Nursing. Convention Hall, Philadelphia, Pa. May 11-15.
National Society for Crippled Children and Adults. Pick Congress Hotel, Chicago, Ill. May 25-28.
National Tuberculosis Association. Palmer House, Chicago, Ill. May 25-28.
Nuclear Congress (Fifth). Cleveland, Ohio. April 5-10.
Purdue Industrial Waste Conference (14th). Purdue Memorial Union Building, Lafayette, Ind. May 5-7.
Royal Society of Health (66th Annual Health Conference). Harrogate, England. April 27-May 1.

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Starting with methods developed by committees of the Food and Nutrition Section, the volume has been prepared by the Subcommittee on Methods for the Microbiological Examination of Foods. Harry E. Goresline, Ph.D., has been chairman of the Subcommittee and served as editor of the volume. The report has been approved for publication by the Committee on Evaluation and Standards. Each chapter considers methods for related food products. These are:

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Frozen Fruits, Vegetables & Precooked Frozen Foods
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A preface has been written by Ferdinand R. Hassler, M.D., Chairman of the Coordinating Committee on Laboratory Methods.

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1. Garnes, A. L.; Davidson, E.; Taylor, L. E.; Feliz, A. J.; Shidlovsky, B. A., and Prigot, A.: Clinical Evaluation of Povidone-Iodine Aerosol Spray in Surgical Practice, Am. J. Surg., 97:49 1959.

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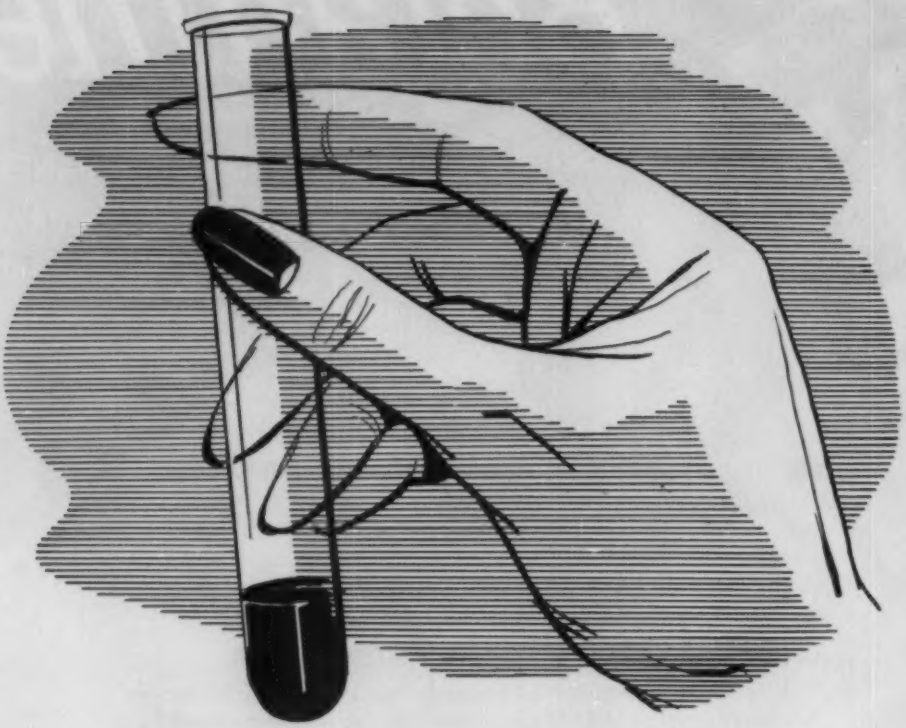

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1. Proceedings National Conference on Hospital-Acquired Staphylococcal Disease, September, 1958, pages 3-10.

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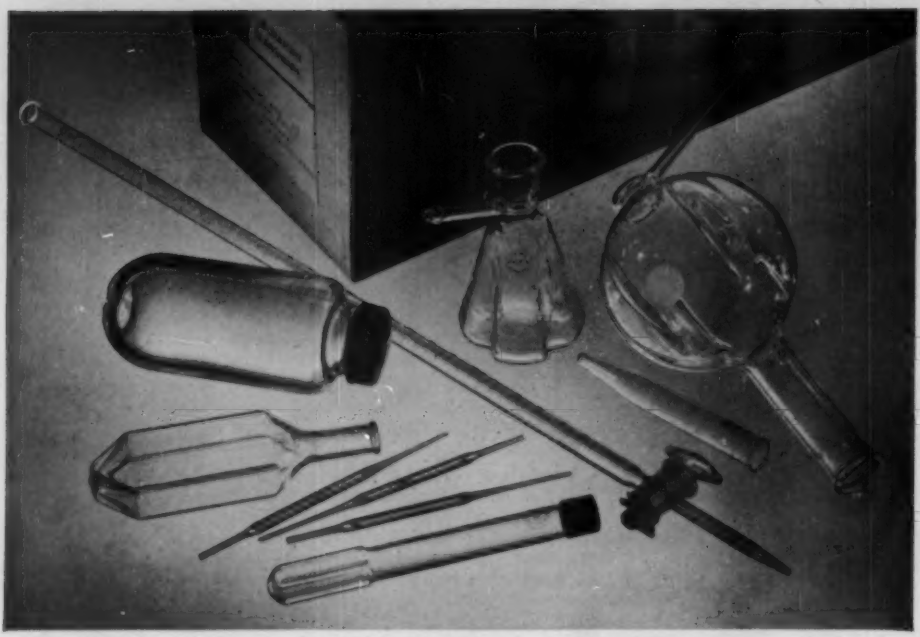

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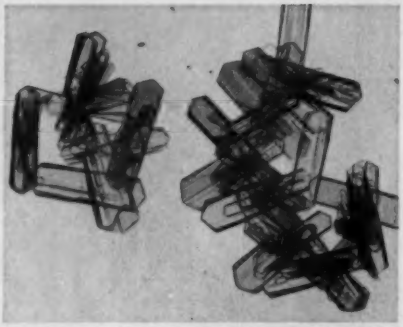

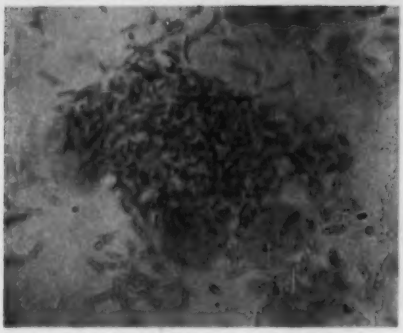

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nutritive composition of average cereal serving

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CALORIES	303	104	83	16
PROTEIN	7.3 gm.	3.1 gm.	4.2 gm.	
FAT	5.3 gm.	0.6 gm.	4.7 gm.*	
CARBOHYDRATE	32.2 gm.	22 gm.	6.0 gm.	4.2 gm.
CALCIUM	0.160 gm.	0.025 gm.	0.144 gm.	
IRON	1.5 mg.	1.4 mg.	0.1 mg.	
VITAMIN A	195 I. U.	—	195 I. U.	
THIAMINE	0.16 mg.	0.12 mg.	0.04 mg.	
RIBOFLAVIN	0.25 mg.	0.04 mg.	0.21 mg.	
NIACIN	1.4 mg.	1.3 mg.	0.1 mg.	
ASCORBIC ACID	1.5 mg.	—	1.5 mg.	
CHOLESTEROL	16.4 mg.	0	16.4 mg.*	

*Nonfat (skim) milk, 4 oz., reduces the Fat value to 0.1 gm. and the Cholesterol value to 0.36 mg.
**Based on composite average of breakfast cereals on dry weight basis.

Cereal Institute, Inc.: Breakfast Source Book. Chicago: Cereal Institute, Inc., 1958.

Hayes, O. B., and Rose, G. K.: Supplementary Food Composition Table. J. Am. Dietet. A. 33:26, 1957.

Watt, B. K., and Merrill, A. L.: Composition of Foods-Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

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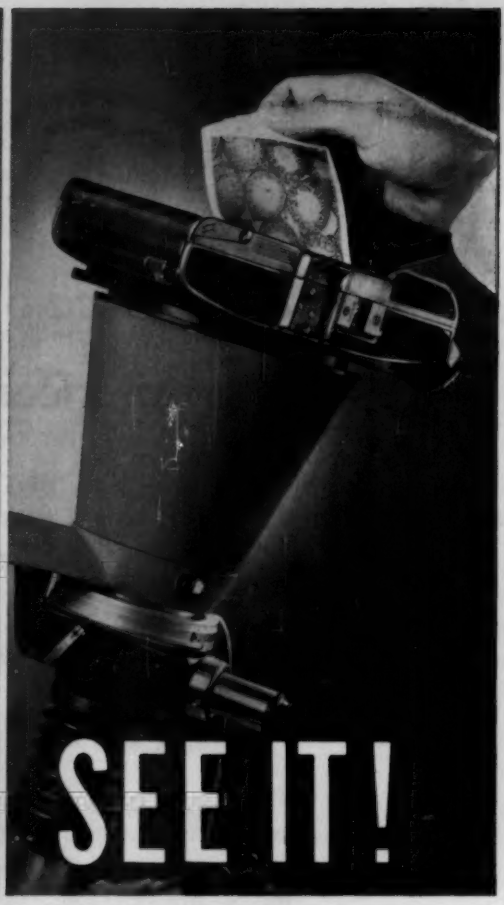

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These figures mean that Americans may well depend on meat as their major source of protein for day-to-day nutrition. In addition to the significant amounts of top quality protein, all meats—including beef, veal, pork, and lamb—provide the gamut of B vitamins and necessary minerals such as iron, potassium, and phosphorus.

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*Agriculture Handbook No. 62, U. S. Department of Agriculture, 1957 (Sept.) p. 33.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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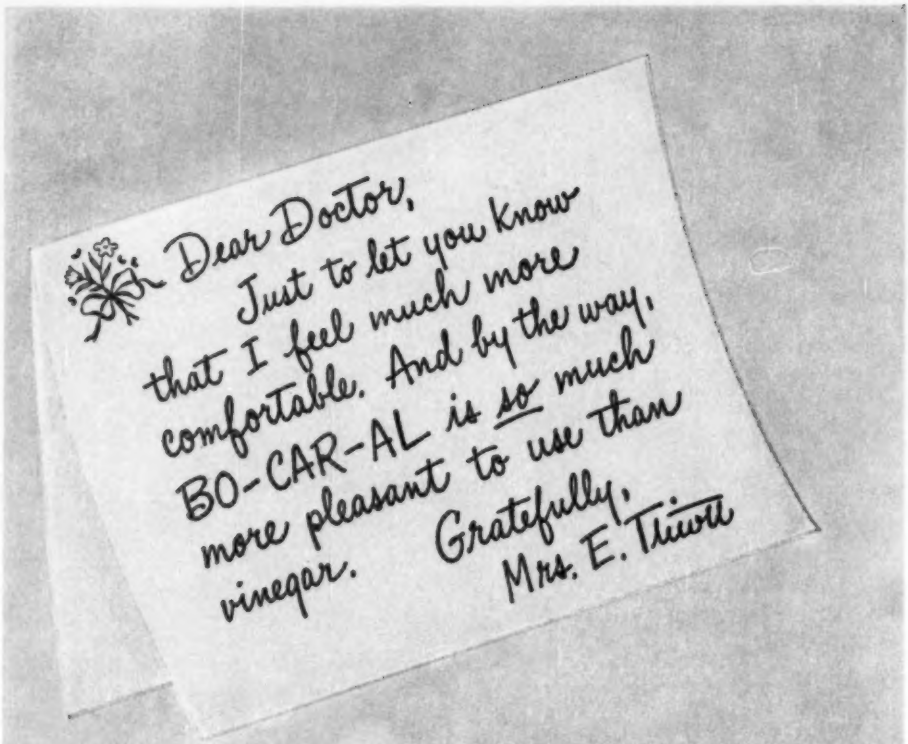

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